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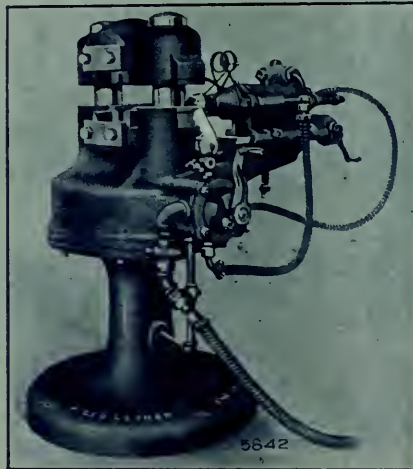
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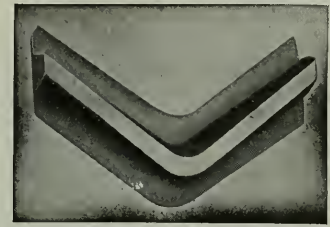
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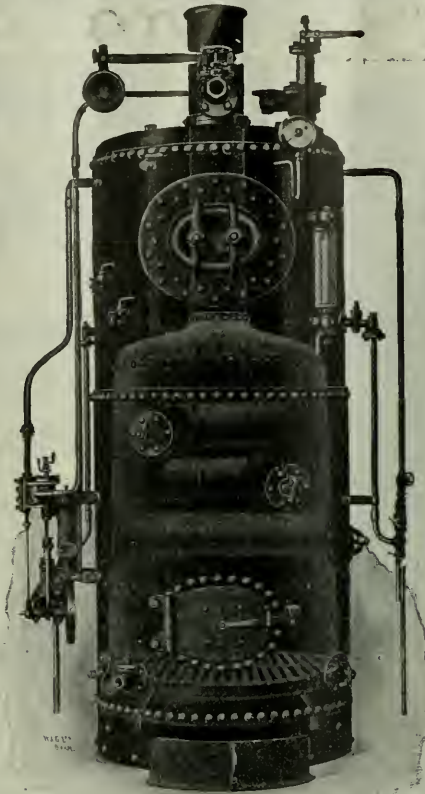
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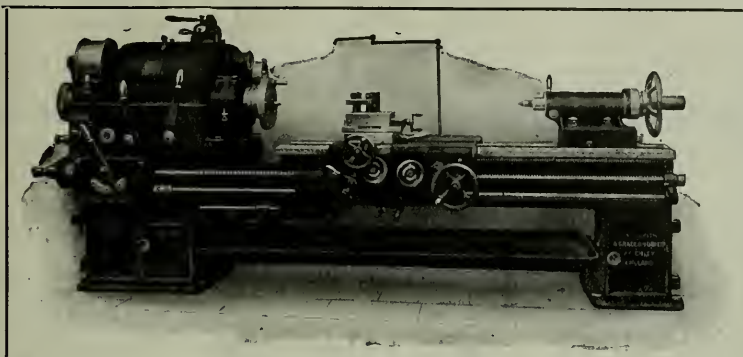
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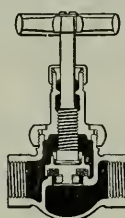
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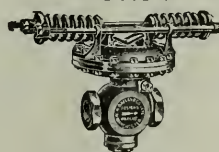
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Notes and News.

Dr. Mellor will in all probability read his paper on the geology of the Western Rand at the next monthly meeting of the Geological Society of South Africa. Since the area to be reviewed not only continues and completes the lower Witwatersrand horizon as far south as Bank Station, but also that to the south-west of the Princess Estate, within which areas some of the most difficult and most hotly debated geological problems are to be found, there will doubtless be an unusually large attendance. A later announcement will be made, of course.

* * * *

H.M. Consul at Lüderitzbucht, German South-West Africa, reports that a copper mine situated at **C.S.W.A. Copper.** Swakopmund division on Khan River has been opened up to a depth of 500ft. The people concerned have completed development work, and are now on the point of erecting large ore concentration works, which will be worked by electricity and be capable of dealing with 50 tons of ore daily. The water required at the works will be pumped up from the Khan River from a spot about eleven miles distant. The mine has already been connected with the Swakopmund-Karibib railway.

* * * *

According to American exchanges, diamond mining is in bad repute in New York, where Brazilian ventures have turned out badly. Nevertheless, men associated with the **Diamond Mining in U.S.A.** Canadian Mining and Exploration Company have taken an option upon the Arkansas diamond field that has been worked in a small way for the last few years. The geological features, as pointed out some years since by Mr. John C. Brauner, at that time State geologist, are entirely favourable. Diamonds of good quality have been found, and since the United States purchases 60 per cent. of the world's annual output and there is a heavy tariff on importations, there is every inducement to develop the field if possible. As an excellent illustration of the scale of modern mining, it may be noted that Mr. W. W. Mein, the engineer in charge, proposes to treat 100,000 tons by way of sampling the property. Nothing less, it is felt, will safely determine the average yield of the ground. Mr. Ralph Stokes, well known in South Africa, is in immediate charge of the work.

* * * *

The cross-cut at the bottom of the Penwith Shaft on this property was re-sampled during the week by Mr. J. M. Calderwood, by whom the samples were made about three years ago which gave such excellent assay results. Since then a sampling by Mr. Dilks, the late manager, has given results which are much lower, and Mr. Calderwood was asked to take a further set in order to corroborate one or other of these contradictory results. It is impossible to say how the returns of the latest sampling will come out, because it has not been possible to get precisely the same exposures as at first, and values in these reefs are often inconsistent.

* * * *

It is reported that yellow ground has been struck at a depth of 6½ feet below the surface, at a distance of 4,500 feet from the "present workings." Since a few thousand claims were spoken of in Mr. Jerry Davies' report of a few weeks ago, it is to be presumed that this strike and the "present workings" are on the same pipe. From a report of the Geological Survey on the same district, made some years back, the "pipe" is probably a volcanic breccia of the same nature as that which was worked at Derdepoort lately without success, and since yellow ground has been found at a depth of a couple of yards it should not be difficult to decide this point more or less definitely at an early date.

Heavy depreciation is again shown by the financial statement just issued by the directors of the **Gold Trust South African Gold Trust**. For 1912 it amounts to £212,160, following upon £173,120 in 1911. A year ago not far short of £110,000 was charged against the year's profits and the balance against reserve; this time £87,160 is written off profits, leaving £125,000 to be deducted from the reserve, reducing that item to £235,000. The realised profits on the past year's operations amounted to £142,760 before writing off the sum mentioned for depreciation, whereas for 1911 the profits were £216,000. Consequently the shareholders are receiving a balance dividend for 1912 of only 1s. per share, making 2s. for the twelve months, as against 3s. 6d. for 1911.

* * * *

As usual, the Robinson led the companies of the Central Mining group, last year, in profit per ton with an earning of 26s. 9d. Next on the list comes the Village Main Reef, 21s. 4d. The Ferreira Deep is third with a profit on the unit basis of 20s. 4d. The fourth name is that of the Modder B., 19s. 8d., and fifth the New Modderfontein, 18s. 4d. The Robinson, too, had the lowest working expenses and the highest recovery per ton. The following table sets forth the average results on the tons milled basis:

AVERAGE RESULTS.

	Revenue p. ton.		Expenses p. ton.		Profit p. ton.	
	1912.	1911.	1912.	1911.	1912.	1911.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Bantjes Cons.	29	3	27	4	24	1
City and Suburban ..	36	11	29	10	21	9
City Deep	35	6	30	9	23	7
Crown Mines	31	9	35	0	18	3
Durban Road. Deep.	29	11	29	0	24	4
Ferreira Deep	41	1	43	7	21	6
Geldenhuis Deep	30	0	28	8	25	7
Jumpers	42	1	37	2	36	3
New Heriot	38	3	36	6	22	6
New Modder	38	2	31	1	19	10
Nigel	29	6	31	1	23	3
Nourse Mines	29	9	30	4	21	2
Robinson Gold	42	4	45	11	15	7
Rose Deep	29	0	26	7	17	5
Village Deep	29	0	26	7	19	11
Village Main Reef ..	39	4	37	4	18	3
Modderfontein B. ..	36	4	33	3	17	8

* * * *

The journal of the South African Association for the Advancement of Science contains a paper on the salt pans of the coast region, in which reference is made to the primitive conditions under which many South African salt pans are worked, and it is pointed out that while every assistance is given to agriculture, nothing appears to have been done by Government to aid in the exploitation of these valuable assets. We still go on year after year importing large quantities of salt, whereas there are sufficient pans in South Africa to produce all that is required, the fact that the quality does not come up to a satisfactory standard being solely attributed to lack of scientific knowledge as to the best methods of production. The paper proceeds to deal with the history and description of some of the salt pans in the eastern portion of the province. It does not discuss in detail the question of the possibilities of the further development of the industry from the commercial standpoint. An idea of the general position regarding salt production may be gleaned from a paper in a recent issue of *Engineering*, dealing with the salt industry of Russia, where, it is stated, there are two districts alone which could supply the whole world with salt for several centuries. It is also stated, among other things, that the price has risen considerably in Russia of late years, which is attributable in a large measure to the formation of syndicates. The Russian industry is very extensively developed, and there is a very large and increasing output.

It has been decided to suspend development operations on the Rand Klip mine, development having failed to disclose any workable quantity of payable ore. Moreover, the cash provided for opening up the property is nearly exhausted. Accordingly, the Board has decided to suspend operations at the end of March, and to retain some £10,000 which is considered ample for the protection of the company's property. It may be recalled that reef was intersected in the Rand Klip shaft in June last at a depth of 1,804 ft. The values obtained at the point of intersection were disappointing. Driving was commenced east and west, and a main winze sunk. From a second level other east and west drives were started. Unfortunately, the development results secured have been very poor. Indeed, the latest statements published show that at almost every point unpayable values were encountered. The non-success of the Rand Klip Company undoubtedly is unfortunate. It tends to throw a shadow—a small shadow, it is true, but nevertheless a shadow—over the Further East Rand, a district which has been the bright star of this gold field for several months past, and a district in which development has given remarkably uniform and good results. After all, however, the failure of the Rand Klip, so far, to secure profitable values must be regarded merely as further proof of the accuracy of the blotting paper theory of gold distribution in the Main Reef Basket series, and the Rand Klip must therefore be looked upon as just one sporadic blot of impoverishment on a sheet that has been remarkably consistent in pay values.

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Development is being accelerated at the Princess Estate, and the footage driven, sunk and risen this quarter will, in all probability, be substantially in excess of that achieved in the preceding three months. In the Western or West Rooodepoort Deep section the shaft is being sunk to the eleventh level. The disclosures may be described as encouraging. Values naturally vary somewhat, and in some places are much better than in others. We learn that in the central portion of the property development widths and values are excellent.

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We note with pleasure that *South Africa* at last has taken our advice and revised the ridiculous estimate regarding the life of the Witwatersrand or "Knights" mine that for so long appeared in its columns. The figure now given stands at "Life in Years 7 b." Reference to "b" informs one, "This estimate takes no account of the deep level portion of the property." We marvel at *South Africa's* modesty! Surely Mr. Mathers should have a little more definite knowledge of one of the Rand's leading mines than this nebulous note implies.

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Quite apart from the great Shamva mine, the immensity of which tends rather to overshadow all other mines in its neighbourhood, there is considerable activity being displayed in the Abercorn District of Mashonaland at present. Amongst other active propositions, it is interesting to learn that the Elise 'Nor Syndicate is erecting a 3-stamp Dolly at the back of the Shamva, that the New Found Out continues to record excellent returns, and that the Mont d'Or is maintaining an extraction of about 30 dwts. per ton. Another little mine doing uncommonly well at present is the Virgin, where crushing is proceeding, and where, during January, no less than 63 ozs. were won from 31 tons of ore. As to the railway, we learn that this has been unfortunately delayed, and is still some miles from the Shamva. The construction of the Poorti bridge, the most difficult section of the work, has been seriously interfered with by heavy floods, and it is understood that, owing to recent experiences, it has been decided to make important alterations in the work.

Attention is called to the excellent report made by Mr. James Gray, F.I.C., the well-known chemist and analyst, on the merits of the "Benoni Tshisa Stick." "Benoni Tshisa Stick," which appears in our advertisement columns. Mr. Gray's testimony is confirmed by many who have had practical acquaintance with the stick, and it undoubtedly will prove a boon to miners on the Rand.

* * *

Senator Lance has performed a useful national service by his proposal that a Commission be appointed to inquire into the question of the natural resources of the country. It is a very wide question, because it would apply to every phase almost of Nature. The first job for the Commission to tackle is a list of the natural assets of the country—water power, rivers, forests, undeveloped lands of all kinds, whether in private hands or not, the minerals, indigenous plants and herbs—such as buchu, stramonium, etc., which all have a value in the market places of the world; markets which can be served by South Africa, soil values, succession of crops and the suitability of certain crops for certain districts; in fact, everything that will tend to help the country is all of importance to such a Commission. The Canadian Commission is formed of men eminent in the commercial life of that Dominion, men who have shown for the most part their appreciation of the value of the country's assets by absorbing many of them to their own benefit. Now, however, they are chosen to preserve what are left; and to whom better could the job be given? There are no fees and no emoluments, bare expenses being allowed when travelling on the Commission's business. If the South African Commission is based on the Canadian pattern, the country will be well served.

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The second edition, revised and enlarged, of the *S.A. Mining Directory*, has now appeared. It contains an enormous, classified mass of varied and exclusive information of a sort that no mining man, engineer, or business man can afford to be without. The shifting character of the personnel of the mines is now so generally recognised that the need for a Directory, giving an accurate and revised list of the principal officials, from the manager downwards, is every day more strongly felt. That need the *South African Mining Directory* completely supplies. The issue contains a carefully revised and corrected compilation of the officials of each and every South African mine, including the Mine Managers, Consulting Engineers, Consulting Mechanical Engineers, Consulting Electrical Engineers, Consulting Metallurgical Engineers, Town Secretaries, Buyers, Mine Resident Engineers, Mine Secretaries, Compound Managers, Chief Surveyors, Mine Doctors, Mine Storekeepers, Battery Managers, Cyanide Managers, Underground Managers, Shift Bosses, etc., with their Telephone and P.O. Box numbers. In addition, complete and revised lists are included of all the officials and members of the various organisations connected with the mines, such as the W.N.L.A., the new Labour Recruiting Corporation, and public bodies such as the S.A.R. and Union Mines Departments. Needless to state, the value of the work depends upon its accuracy, and arrangements have been successfully completed whereby every change in the personnel of the staff of the mines is included. It is notorious that ordinary annual Directories fail to afford any reliable guide to the holders of positions on the mines, because of the changes that take place each month, causing annual directory information to be misleading and incorrect, often by the time it appears in print. Moreover, no directory now published attempts to give the full list of officials of each mine such as appears in the *South African Mining Directory*. In a hundred different ways, and in a hundred different spheres of business, the work will be found invaluable for everyday use. To merchants and agents anxious to circularise the mines, and to ensure that their circulars come under the personal notice of the leading officials, the accuracy of the directory will prove of the utmost importance. The offices are at 119, 126, Exploration Buildings, Johannesburg.

TOPICS OF THE WEEK.

THE MINING INDUSTRY IN PARLIAMENT.

THOUGH no Bills dealing directly with the mining industry have yet come before Parliament this session, the industry has by no means been ignored. Question time and motion day have found members—mainly, it must be said, of the Labour persuasion—busy with lengthy detailed and searching queries on every conceivable aspect of mining, from phthisis to native labour and from metallurgy to mine regulations. Not all of them have been as unintelligent and meaningless as that of the Labour light who wanted the returns of cut diamond imports into the Union—what earthly use the figures were, not even the questioner could tell! Indeed, several questions were of considerable financial interest, and might have emanated from an enterprising stockbroker or hopeful shareholder. For instance, the ingenious question from the Member for Springs as to when the Van Dyk, Rand Collieries, Grootvlei, and Welgedacht mines would restart operations produced the equally ingenious reply from the Minister, "As soon as a favourable market enables the companies to raise the money necessary to prosecute operations on an adequate scale." To another question by Mr. W. B. Madeley as to whether the gold mines on the Witwatersrand are consistently conforming to the provisions of the eight-hours section in the Mines Regulations Act, 1911, the Minister of Mines replied in the affirmative. "A few complaints," he said, "have been made to the department about men being detained underground beyond the 48 hour limit per week. One of these is under investigation at present, but generally the shift time-tables arranged by managers preclude the possibility of serious infraction of the law." In regard to the payment of Mozambique native labourers, Mr. P. Duncan asked the Minister of Mines whether, in view of the proposed arrangement between the Portuguese authorities in Mozambique and the Witwatersrand Native Labour Association whereby part of the wages of native labourers imported from Mozambique are to be withheld from them and paid in Portuguese territory, any instructions have been given to the Director as to giving or withholding his consent under Section 15 of the Native Labour Regulation Act, 1911, or any arrangement has been made with the Witwatersrand Native Labour Association as to the giving or withholding of such consent? The Minister of Finance (replying on behalf of the Minister of Native Affairs) said: "The answer to each question is in the negative. I am advised that the arrangement referred to, which provides for an extension of the existing system of deferred payment of wages, does not involve any breach of the Native Labour Regulation Act. The system, it may be mentioned, has been in operation since 1903, when it originated with an experimental batch of 1,000 natives from British Nyasaland; in 1904, it was applied in respect of Portuguese Nyassaland natives; in 1905, to those from Quilimane and Tete; and in 1909, to those from Mozambique." It is understood that the matter is to be brought up again on motion day, in view of the unsatisfactory nature of this reply. In another series of questions, the Springs representative asked (1) What was the total amount of money expended in installing and experimenting with the Way-Arbuckle reduction plant on the Apex Gold Mining and Benoni Consolidated Companies at Benoni; (2) is it not a fact that this plant had previously been tried upon another mine on the Witwatersrand and proved a failure; and (3) whether he is aware that these two mines were closed down as a result of shortage of money, and in view of the waste referred to in paragraph (1) hereof; and whether he will cause enquiry to be made, with the view of ordering a restart to be made immediately? To this the Minister of Mines replied: (1) I have no official information in regard to the first portion of the question beyond what has been published in the companies' reports. (2) The process referred to by the Honourable Member was tried on the East Rand Proprietary Mines on a small scale, to the satisfaction of the directors of the Benoni Consolidated Company. (3) It is understood that the mines were closed down owing to want of funds. I am informed that negotiations are in

progress for the provision of further ample funds for developing these properties, and that an early resumption of work may be anticipated. Under the circumstances no useful purpose would be served by causing an enquiry to be made. A question was also asked as to how many of the applicants for miners' phthisis compensation have received the grants in lump sums; how many have been refused lump sums, and what were the general grounds for such refusal? To this the Minister of Mines replied: Up to the 31st December, 1912, 427 applicants for compensation under the Miners' Phthisis Act, 1912, received lump sums, and 889 received monthly allowances. Of the latter 196 have definitely applied for lump sum grants under Section 19, and these have yet to be considered. The reasons for the majority of the awards having been made in monthly payments are: (1) That the Act contemplates payments being made in that manner, except in special cases, and (2) that in the majority of cases the Board after full investigation of the circumstances was of opinion that payment in lump sums was not justifiable, and that the circumstances of the particular application would be best met by awards in the form of monthly payments. Despite the objection of the Minister of Mines, on the ground of the work and trouble involved, Senator Whiteside, in the Senate, carried a motion that a return be laid on the table showing the number of mine prosecutions in relation to the office held by the accused in each case. Senator Whiteside said he did not ask for the return for his own private information, but because there was dissatisfaction amongst the employees on the Rand, and there was a feeling that everything in the Department of Mines was not as it should be. There was a feeling on the Rand that the administration of the Department was by no means even-handed, and so the return he asked for was of general public interest. From this it will be seen that it will be no fault of our Parliament if mine managers and the Mines Department are not kept busy compiling, during the next few months, returns of more or less doubtful value.

SOME IMPORTANT DIAMOND QUESTIONS.

THE diamond mining industry has been greatly in the public gaze of late, and this increased interest has been reflected by the number of questions asked regarding it in Parliament. The fact that the long-promised Bill to amend the diamond taxation law has been submitted by the Government to those chiefly interested, has, doubtless, been responsible for this greater attention, and the publication of the terms of the Bill is bound to create considerable discussion. There is reason to believe that the Bill aims to favour the Premier shareholders at the expense of the Union taxpayer, and to replace the present fixed tax of 10 per cent. on De Beers by an impost arranged on a sliding scale. We are not in a position to discuss the new proposals in detail, but the Government can rest assured that the Bill will meet with the strenuous and healthy criticism it deserves. It is noteworthy that the Minister of Mines, in a statement elicited during the week, declared that the Government would insist on De Beers resuming work at the Voerspoed. More will doubtless be heard of this new attitude of the authorities towards private enterprise, and we will content ourselves with noting the Minister's statement. Interesting light was thrown on some O.F.S. diamond mines by a question asked in the House of Assembly as to: (1) What profits have been made severally during the years 1909, 1910, 1911, and 1912 by the following mines: (a) Roberts Victor Diamond Mining Company; (b) Blaauwbosch Diamond Mining Company; and (c) Elands Diamonds, Ltd.; (2) what sums have been received by the Government in respect of the forty per cent. reserved to the State in these mines under the diamond law of the Orange Free State; and (3) whether any contract has been entered into with any of these companies for the substitution of a fixed royalty per load or per carat for the proceeds of such forty per cent. share, and, if so, what are the terms of this contract? To this the Minister of Mines replied: (1) The profits for the three companies have been as follows: (a) Roberts Victor, 1909, £65,646; 1910, £8,039; 1911,

£9,603; (b) Blaauwbosch, 1910, £252; 1911, £11,671; 1912, £3,100; (c) Elands—production only started June, 1912. (2) These mines held under agreements under Section 50 of the Free State Precious Stones Ordinance, and the amounts received by the Government have been as follows: (a) Roberts Victor, 1909, £1,200; 1910, £1,200; 1911, £1,560; 1912, £1,934; (b) Blaauwbosch, 1910, £91; 1911, £769; 1912, £344; (c) Elands, 1912, £564. (3) The Blaauwbosch and Elands agreements provide for a rent of 5s. per claim and a royalty of 1½d. per load washed and 10 per cent. of the realised value of any stone found, when the realised value exceeds £1,000. Both companies are subject to the 10 per cent. Profits Tax under Act 6 of 1910, when profits exceed £1,000 per annum. The agreement with the Roberts Victor has come to an end, and negotiations with regard to the new agreement are still pending. In regard to the handling of Premier diamonds, Mr. H. W. Sampson asked the Minister of Mines: (1) Whether the Government is aware that the output of the Premier Diamond Mine is now dealt with by an exclusive financial syndicate or trust in London, which controls also the output of De Beers and Jagersfontein mines; (2) whether the Government, in view of the State ownership of three-fifths of the Premier mine, will take steps to secure an entirely independent and separate valuation of diamonds, and, if not, whether it is content to accept the valuation made for the company and to allow the London diamond buying syndicate or trust to handle the entire output on the basis of such valuation? The Minister of Mines replied: (1) The output of the Premier Diamond Mine is at present sold through the company's own representatives independently of the syndicate referred to by the hon. member. (2) I may add that if at any time the financial syndicate referred to were to be likely to control the disposal of the output of the Premier mine, and if it should become necessary to do so, the Government would take measures to protect its interest in the sale of the Premier output against any adverse combination. An interesting question on De Beers mines compounds profits was also asked by Mr. H. W. Sampson. He moved for a return showing: (1) The total amount of profit made by De Beers Consolidated Company, Ltd., from trading in mine compounds for the past ten years; (2) the general allocation thereof; (3) the nature of the charges ordinarily debited to this trading account; and (4) the balance of profit from this source actually in the hands of the company undistributed at the close of the financial year. The reply ought to be interesting.

The hearing of evidence by the Select Committee on diamond-cutting promises to be fruitful. The Government is sympathetic, but the public are passive, as they believe that if the big producers set their faces against it, the proposal cannot go through. It is pointed out by the semi-official apologists of the latter that Rhodes found the idea impracticable, and therefore abandoned it. It is also pointed out that an aspect of the matter is the enormous enhancement in the cost of the finished article which would result from the transference of the cutting industry to South Africa, or the imposition of a heavy export tax having that object in view. Experience shows that the world will only spend a certain proportion of its income on diamonds, and therefore a great rise in prices would inevitably mean a slackening in demand, which would affect materially the producing industry, upon which the Union depends for a very considerable amount of revenue, direct and indirect. Among other objections to the proposal, it is shown that Senator Munnik talked as though South Africa derived little benefit from the exploitation of diamonds. As a matter of fact, with the increasing depth of the mines the cost of production naturally tends to increase, and therefore the benefit which the country from the exploitation of diamonds gets is greater to-day than it was in the early days of diamond mining. The chief fallacy under which Senator Munnik labours is that the profits of various middlemen who deal in diamonds can be diverted into the coffers of the Union Treasury. It is, in fact, no more possible than it is possible to divert the earnings of the soft goods importer. One can gather from these objections the nature of the pleas that will be entered by the big producers. As the question may be regarded as *sub judice*, further comment may be postponed to the publication of the evidence.

PROSPECTS OF INCREASED DIVIDENDS THIS YEAR.

Better Distributions for Certain Mines Expected—Financial Positions of the Modder B., Brakpan Mines, City Deep, and Randfontein Central Examined.

It goes without saying that, from a shareholder's point of view, no aspect of Rand mining is so engaging as the dividend-earning probabilities and possibilities of the various mines. This year a number of Main Reef companies will, in all likelihood, largely increase their payments to shareholders, and as the subject is of so much interest and importance we venture at this early juncture of the new year, to present some anticipations in regard to the newer dividend payers of the Rand.

MODDER B.

Turning first of all to the further East Rand, it may be remarked that the Modder B., on the January showing, is earning profits at the rate of about £350,000 per annum. A few months ago the earning was substantially higher, but for reasons already fully explained in this journal there has been a marked contraction in grade, with, of course, a resultant decline in profit. The lesser recovery per ton has been the direct result of the company's policy of working the large blocks of ore in reserve without slavish endeavour to obtain non-fluctuating returns which would not conduce to the best results over a lengthy period. Whether the company will improve on the rate of earning during the current year or not is somewhat difficult to say, but we do not regard it as likely that the profit in normal thirty and thirty-one day months will drop much below that reflected in the January statistics. The full reduction plant of the Modder B.—80 stamps and 5 tube mills—is kept employed, and whilst it is intended to largely increase this equipment in the future, provided that development continues to be satisfactory, it is not to be expected that there will be any appreciable augmentation of tonnage this year. Increased profit will then have to be derived through (a) increased grade, (b) decreased working costs, or (c) a happy combination of these two circumstances. The capital of the Modderfontein B. Gold Mines is £700,000 in 700,000 shares of £1 each, all issued. The financial position of the company at the beginning of the last financial year was that there was a liability of £74,611. Profits for the year are estimated at about £358,000, the highest quarter's earning being in the three months ended September, when £101,323 was won. Capital expenditure for the nine months ended with September amounted to about £21,000, and the Union Government profits tax, plus French fiscal taxes, to £28,000. Probably the amount available for distribution was in the neighbourhood of £215,000. The first dividend was declared, which absorbed £140,000. Apparently something like £71,000 was carried forward. Assuming that profits aggregating £350,000 are earned during the current year, there should, after making allowance for profits tax, and taking in last year's balance, be between £350,000 and £370,000 available for distribution at the end of the current year. Whether any of this will be earmarked for further capital expenditure or not we cannot present say, but it looks as if there would be ability to pay something like 45 or 50 per cent. for 1913, as compared with 20 per cent. last year.

BRAKPAN MINES.

The prospects of increased dividends at another Further East Rand mine afford interesting material for study. The Brakpan Mines Company was entirely out of debt at the end of last April. The present rate of profit-earning is about £40,000 per month, and the capital of the company three-quarters of a million. The company's first dividend of 15 per cent. was declared in June, and in December 25 per cent. was distributed. The maintenance of profits at about their present level seems probable, and, therefore, continued payments of 25 per cent. per six months may apparently be counted on. This should mean 50 per cent. in respect of the 1913 operations, or 10 per cent. more than was announced last year.

CITY DEEP.

Turning now to the Central Rand, the City Deep calls for examination. As was anticipated by us in our issue of October 5th last, this company paid out its first dividend last year—one of 12½ per cent.—which, on the issued capital of £1,250,000, absorbed £156,250. The present rate of profit-earning is about £300,000 per annum. Operations have, as is generally known, been much impeded by labour shortage, and were more natives available the tonnage milled would be appreciably increased and the earning correspondingly bettered. The whole of the indebtedness of this company, as shown in the last balance sheet, has been extinguished, and the company has been accumulating cash since last March. This year's profit will, of course, be subject to the usual reduction on account of the profit tax due to the Government and the annuity due for mining rights under water-rights—£6,564 per annum. As stated by the Chairman at the last meeting, £20,000 will be required for electrifying the hoists, and we presume that this will be met out of the current year's profits. It would appear that at the present rate of profit-earning the company will have about a quarter of a million available for distribution at the end of the current year, which would seem to indicate a dividend of twenty per cent. Of course, an improvement in the labour supply would mean a better earning. The position in regard to profit-earning, etc., may best be gauged from the following table, which states the results of productive operations for the past thirteen months.

	1912.	Stamps at Work.	Tube Mills.	Tons Crushed.	Working Costs p. ton. s. d.	Output. Ozs.	Profit.
January	...	110	9	37,860	22/ 0	14,827	£20,163
February	...	110	9	37,940	22/ 1	14,722	19,471
March	...	110	9	40,030	22/ 9	16,047	21,250
April	...	110	9	39,000	23/ 4	16,291	22,402
May	...	110	9	40,700	24/ 1	17,872	25,646
June	...	110	9	40,200	23/10	17,696	26,050
July	...	110	9	41,600	24/ 4	18,116	25,106
August	...	110	9	41,500	24/ 0	18,160	26,154
September	...	150	8	37,000	25/11	17,017	22,186
October	...	150	9	43,100	23/ 4	18,561	27,295
November	...	150	8	41,300	24/ 1	18,719	27,894
December	...	150	8	39,400	25/ 0	18,306	26,627
1913.							
January	...	150	9	42,700	25/ 1	18,831	25,248

RANDFONTEIN.

From the West Rand there appears to be a likelihood of increased distribution by the Randfontein Central. It may be recalled that this company paid out a first dividend—one of 5 per cent.—at the end of the year. The company is now earning profits at the rate of a million a year, and the financial position at the end of 1912 was that the company's indebtedness to the Randfontein Estates of £365,000 had been fully paid, and that available cash, unrealised gold, etc., amounted to about £360,000. Out of this a dividend absorbing £209,685 was declared. After making all due allowance for profits tax, etc., it seems certain that the dividends for 1913 will be very substantially in excess of the amount paid out in respect of the 1912 operations—at least double. There are, in addition to the companies here dealt with, other concerns which will in all probability increase their distributions this year. We have, however, dealt with the mines which at the moment are engaging chief attention from investors. The figures given in regard to finances, and the anticipations as to the probable declarations for 1913, are based on the most authenticated information available, but must not be regarded as official.

THE POSITION OF THE TIN MARKET.

Part Played by the Transvaal—Average Prices, Supplies and Demands.

THE production of tin in the Transvaal last year, according to statistics of sales, was 2,726 tons, worth £338,897, as compared with 3,373 tons, worth £395,472, in 1911. It will be observed that whilst the quantity was 647 tons less the value declined by not more than £56,575, thus reflecting the higher average price obtaining. Although the output declined last year, and the contribution of the Transvaal was 2.4 per cent. of the world's production, as compared with 3.1 per cent. in 1911, this country, nevertheless, must be reckoned amongst the most important of the "younger" productive tin areas, not only because of the excellent returns declared in the first year or two of production, but also because of the unquestionably great possibilities of expansion in the Waterberg area. Indeed, the Transvaal fairly may be said to have entered the world's arena of tin output, and accordingly statistics of international importance, such as those bearing on supplies and deliveries, average prices, and visible stocks must possess a particular significance for the Transvaal. In the first place, statistics as to the production of the world may be stated. Necessarily these are based upon the market reports of shipments and receipts. The major part of the production is recorded in what are generally termed in the trade as "the statistics," which cover about three-quarters of the total. The essential figures are embodied in the appended tables, which cover the year ended with November 30th. The first table states supplies and deliveries of tin, included in "statistics" in long tons:—

Supplies.	1911.	1912.	Changes.
Straits exports	53,470	59,962	I. 6,492
Australian exports	4,048	3,898	D. 150
Banka sales	14,908	15,857	I. 949
Billiton sales	2,208	2,208
Total supplies	74,634	81,225	I. 7,291
Deliveries.			
Great Britain	15,202	16,748	I. 1,546
European Continent	22,525	24,972	I. 2,447
United States	39,150	43,440	I. 4,290
Total deliveries	76,877	85,160	I. 8,283

The supplies of tin entering into consumption but not included in statistics in long tons were:—

	1911.	1912.	Changes.
Chinese exports	2,411	3,730	I. 1,319
Bolivian exports	22,177	20,766	D. 1,411
Cornwall production	4,500	4,450	D. 50
Transvaal production	2,256	2,350	I. 94
Miscellaneous	850	975	I. 125
Total	32,194	32,271	I. 77

The visible stocks of tin on December 31, 1912, are reported as in the accompanying table, in long tons:—

	Stone.	Afloat.	Total.
Great Britain	2,285	4,526	6,811
Holland	712	183	895
United States, excluding Pacific ports	1,290	1,981	3,271
Total	4,287	6,690	10,977
Total, 1911	9,195	7,319	16,514

The decrease during the year in visible stocks was 5,537 tons. There is a considerable production of tin which is not included in the statistics, and the estimated quantity of this is given in Table II. This tin is usually accepted as entering immediately into consumption. The total production, as covered by the two tables, was 106,828 long tons in 1911, and 114,196 in 1912; an increase of 7,368 tons,

or 7 per cent., the increase in deliveries being 7.7 per cent. for the year. As to the price of tin, the following table gives the monthly average prices of tin in 1911 and 1912 in pounds sterling per long ton:—

	1911.	1912.
January	£186.896	£191.510
February	189.642	195.036
March	182.617	192.619
April	193.042	200.513
May	197.767	208.830
June	207.388	205.863
July	193.100	202.446
August	190.479	208.351
September	180.846	223.762
October	187.138	228.353
November	194.967	227.619
December	203.358	226.875
Av. year	192.353	209.322

In March last the great coal miners' strike in Britain naturally affected tin, as it did all other metals. Consumption was restricted and speculative enterprise attracted to other markets. The next month, however, prices advanced persistently. December opened with a lower tendency, but a good demand developed, and towards the mid-month prices advanced. The close of the year found prices the highest for the month—£229 10s. for spot and £229 for three months. As to the effect of the Balkan War on the tin metal market, our contemporary, the *Engineering and Mining Journal* of New York, writes:—About the middle of October, when the troubles began among the Balkan States and Turkey, the tin market in London was adversely affected for a few days, scoring a maximum decline of about £7. However, it not only quickly recovered from this decline, but made further advances, so that quotations were established in this market at about 50½c. per lb. about the middle of October. It remained on the basis of 50c. per lb., with slight variations, until the end of November. The war in South-eastern Europe is said to have interfered greatly with a large part of the European consumption of tin, and while the American business continues to be satisfactory, orders from European consumers have, for the above reason, fallen off considerably. The market was but slightly affected by these considerations, and stood at about 49½c. per lb. at the beginning of December. American consumption continued at a high rate, and purchases were therefore made on a liberal scale. This sustained the market, giving it a firm undertone, with prices ruling at between 50c. and 50½c. per lb., in New York, up to the end of the year. In conclusion, we state the production and sales of tin in the Transvaal for last year:—

Month.	Tons Produced.	Tons Sold.	Est. Value.
January	262	234	£26,682
February	231	212	23,003
March	249	236	26,586
April	244	217	26,782
May	261	341	42,180
June	279	364	42,643
July	290	239	29,484
August	270	294	39,588
September	238	247	34,066
October	218	207	28,940
November	199	135	18,943
December	247	222	31,109

Nigel G.M. Co.

The returns from the Nigel Company's mine for January are as follows:—Gold, 4,742 fine ounces; profit, £4,021; stamps working, 75; value of gold, £20,143; tons milled, 13,800.

CHIEF GOLD PRODUCERS OF THE RAND.

Eight Mines Produce 50 per cent. of Total Profits—A Group of Steady and Reliable Ventures—The Lesser Undertakings and Their Contributions.

ALTHOUGH there were fifty-four Rand gold mining companies which declared profits for the month of December last, a brief examination of the Chamber of Mines Analysis for that month suffices to show that a comparatively few were responsible for the greater portion of the total profit declared. It is rather startling to find, on closer investigation, that eight companies only contributed no less than 50·64 per cent. of the aggregate working profit of £1,129,372 which was the result of the month's operations. A further ten concerns returned 25·29 per cent. of the total, so that more than 75 per cent. of the whole declared working profit was obtained by one-third of the producing companies. The following figures will make the position more clear:—

December, 1912.	Tons Milled.	Per Ton Milled.		Total Working Profit.	% Total Rand Working Profit.
		Recovery.	Cost.		
Crown Mines ...	175,000	31/ 9	17/ 3	£123,796	10·96
E.R.P.M. ...	155,500	30/ 7	19/ 6	94,654	8·38
Randftn. Cen. ...	216,648	24/ 5	16/ 4	88,207	7·81
Robinson ...	47,500	43/11	15/11	65,614	5·81
Ferreira Deep ...	54,660	42/ 0	20/ 0	58,200	5·15
New Modder ...	50,500	40/ 8	19/ 2	53,160	4·70
Simmer & Jack ...	75,000	23/ 7	11/ 7	44,242	3·92
Village M. R. ...	41,500	39/10	18/ 2	44,160	3·91
	816,308				50·64

It will be observed that the recovery value of some of these companies is fairly high, only two being below the Rand average for December of 28s., and several being considerably higher. The working costs compare favourably with the average of 18s. per ton milled for the same month. Evidently the position held by these companies, as being the chief contributors to the monthly profit aggregate is largely due to the fact that the grade of the ore milled is somewhat high, for, although their proportion of the profits is equal to about 50 per cent., their proportion of the total tonnage milled is approximately thirty-seven. Since working costs are apparently not susceptible of any very great diminution, it is clear that if the total profit yielded by the mines concerned is to continue to swell the output as it does to-day, very much depends upon their capacity to maintain the existing milling grade. There is the alternative, of course, of a higher crushing output on a lower recovery basis, but as far as can be seen at present there is little reason to assume that the results on this basis would be materially higher than they are now. The future progress of these eight companies will naturally be watched with the keenest interest, because they not only contribute handsomely to the revenue of the country direct, but as employers of labour they are the source whence much of the money is derived which circulates through the commercial channels of the country. For this reason it is not encouraging to know that two of the concerns on our list, the Robinson and Village Main Reef, which are responsible for nearly one-tenth of the profit returns, are destined to exhaustion at no distant date. The E.R.P.M. and the Randfontein Central are at the moment in a state of unstable equilibrium, so to say, and it is difficult to say whether the future will record an improvement or a falling off in their returns. The Crown Mines and the New Modderfontein have excellent prospects, however, while those of the Ferreira Deep and the Simmer and Jack are distinctly good. Taken altogether, it will be seen that unless these four companies are able to make up for the deficiencies

of the others, some of which deficiencies are not improbable and others certain, there is a likelihood of a pronounced diminution in the aggregate profit returns of the whole group which will need to be balanced by an appreciable increase of profit from the new mines of the further East.

A LESS DISTINGUISHED GROUP.

As has already been remarked, ten companies in December last contributed about 25 per cent. to the aggregate profit, making up with those previously mentioned about 75 per cent. of the total sum recorded. Statistical data in connection with the operations of this minor group of producers are given here:—

December, 1912.	Tons Milled.	Per Ton Milled.		Total Working Profit.	% Total Rand Working Profit.
		Recovery.	Cost.		
Brakpan Mines ...	59,408	30/ 6	16/ 6	£41,233	3·65
Rose Deep ...	68,500	27/ 5	16/ 5	36,840	3·26
Modder B. ...	34,130	37/ 2	16/ 6	34,666	3·07
Robinson Deep ...	56,300	25/10	15/ 7	29,651	2·62
City Deep ...	39,400	38/11	25/ 0	26,627	2·36
Van Ryn ...	39,700	27/ 7	15/ 2	24,721	2·19
New Kleinfontein	51,400	27/ 2	17/10	24,642	2·18
City & Suburban	27,300	37/ 3	20/ 7	23,045	2·04
Village Deep ...	50,800	29/ 0	19/ 9	22,569	1·99
Knights Deep ...	108,100	14/10	10/ 9	21,846	1·93
	535,038				25·29

From this table it will be seen that with a crushing equal to about 25 per cent. of the total, or, to be more precise, 24·12 per cent., these ten concerns yielded a little more than 25 per cent. of the total Rand working profit for the month. A curious fact, similar to one already referred to in connection with the mines of the second table, is that with a tonnage equal to about 13·60 of the whole quantity milled, this group contributes a profit equal to 13·66 per cent. of the whole. Although not so brilliant in their performances as those on the first list, these companies are all substantial undertakings which may be relied upon to go ahead steadily for a long period, with the prospect, in some instances, of a material improvement. They may be regarded as forming the backbone of the gold mining industry of the Rand. There are a few high recovery returns to be seen in the list, and these, of course, constitute an element of some uncertainty. Following them come a group of mines each of which has the distinction of returning not less than one per cent. of the monthly profit, as recorded for December last.

CONTRIBUTING OVER ONE PER CENT.

These companies, with the exception of the Consolidated Main Reef and Consolidated Langlaagte, which have yet to reach the apex of their capacity, and the New Primrose, which is one of the expiring concerns, are probably running at an approximately normal pace. In a little less degree than those of the group previously referred to, they are a substantial part of the industrial assets of the Rand, and are, as a group, unlikely to alter the aggregate profit returns to any notable extent, either in one direction or another. It is interesting to note that their contribution to the aggregate profit bears, roughly, the same ratio to that of the previous group as those do to the brilliant examples first mentioned.

December, 1912.	Tons Milled.	Per Ton Milled.			Total Working Profit.	% Total Rand Working Profit.
		Recovery.	Cost.			
Nourse Mines ...	48,600	30/ 5	22/ 1	£20,263	1.79	
Witwatersrand ...	37,980	25/ 0	14/ 9	19,581	1.73	
New Primrose ...	25,100	27/ 4	13/ 5	18,917	1.67	
Meyer & Charlton	14,188	44/ 0	17/ 8	18,547	1.64	
Witwatersrand D.	37,490	27/ 9	17/10	18,465	1.63	
Langlaagte Est. ...	53,766	20/ 7	17/ 3	18,018	1.59	
Cons. Langlaagte	37,500	27/ 8	19/ 4	15,741	1.39	
Consolidated M. R.	18,997	36/ 0	22/ 3	12,709	1.12	
Wolhuter ...	27,600	26/ 8	17/ 3	12,474	1.10	
	301,221				13.66	

The comparatively high recovery values of the Meyer and Charlton and the Consolidated Main Reef may be noted. The remaining mines on the Chamber of Mines list, inasmuch as they form but insignificant units, need scarcely be referred to. In conclusion, it is of interest to remark that the dozen mines between the Consolidated Main Reef and the City Deep, both inclusive, returned about 40 per cent. of the total monthly profit for December last, thus showing again how much we are at present dependent upon the mining operations of the central section of the Rand. The tables given above deal with, roughly, 76 per cent. of the tonnage, and 89.59 per cent. of the working profit declared.

THE FUTURE OF SLIME TREATMENT.

Far-Reaching Effect of the Moore Judgment—Reversion to Decantation Method Mooted in America—Filter Practice Come to Stay Locally.

WITHOUT question the metallurgical event of 1912 was the unanimous judgment of the United States District Court of Appeals by Judges Buffington and McPherson, sustaining the Moore Filter Process as a fundamental and basic patent. The effect of this award, apparently, is to throw all filter processes under a Moore master patent. The result will be a far-reaching one. It is, in fact, impossible just at present to foresee all the consequences of this important legal decision, but it is at the least significant to note that, prompted largely by the judgment of the District Court of Appeals, the "Engineering and Mining Journal of New York" is discussing alternative processes for the removing of auriferous solutions from slime. In a recent issue our American contemporary mentioned that for some time, and quite irrespective of this judgment, many cyanide metallurgists have been dissatisfied with filter processes, owing to the high cost of installation and operation, and have proposed, and in some cases adopted, the decantation system once more. The journal in question continues that such plants as have been erected recently on the old principle, employ a very different process from the old original decantation, and, in fact employ the continuous process involving successive thickenings and dilutions, a number of strengths of solutions being used, the lowest being extremely dilute and practically barren. Where water is plentiful and where weak solutions can be used, it is possible to employ the continuous decantation process without filters, but where stronger solutions are required, as is the case with silver ores, the filter must be used as an accessory.

The "Mining and Scientific Press," in its issue of December 14th, discusses the New York paper's proposal, and shows the limits of the applicability of decantation of slime, arguing that such an alteration of practice would be reactionary and atavistic. The views of the "Mining and Scientific Press" are as follows: "The first great step in successful treatment of slime was the application of filtration to the problem. Fine material may be treated by decantation, but filtration introduces notable economies. The reason, as also the limitation to successful application of decantation, is not difficult to see when the behaviour of finely ground material in solutions is analysed. There is more pore space in a fine mud than in coarse sand settled in water, but the spaces between individual solid particles are narrower. It follows that the channels or openings through the mass are smaller and more tortuous. The mass is less permeable, and to obtain the same rate of flow extra force of some sort must be given to the liquid material which it is proposed to pass through the mass of solid particles. In settled sand the open spaces are sufficiently large to permit gravity alone to pull solutions through the mass at a rate that makes commercial results possible in treatment plants. With slime, to obtain the same rate of flow requires a vacuum or pressure. The proposal to obviate this difficulty by continuous

agitation and decantation has been made many times, and plants designed on this plan are in successful operation treating finely ground material that is really a sand. In them the individual particles are kept freely floating, each completely surrounded by solution, and never allowed to completely settle. As a result, there are no pore spaces, and the particle rather than the mass becomes important. The plan is ingenious and there is a field for such treatment plants, but not a universal one. The reason lies in the difference in specific gravity between sulphides and silicious particles. The very ores that most need sliming for successful treatment are those in which the gold and silver is locked in the sulphides. It is to release this gold and silver that the ore is slimed. In practical operation of treatment plants where concentrate is cyanided, it is universally true that the sulphides are found to require more time for treatment than the other material. The relations of the valuable to base metal are closer, and complete solution of the gold and silver is harder to obtain. In continuous agitation and decantation, the first particles to settle are sulphides, and with them goes much of the gold and silver. The result is that the material which should receive the longest treatment really escapes from the system first, and there seems no general way to avoid this without completely destroying the process itself. The old process of decantation is available for coarse material; continuous decantation can be used on coarse and finer material and is useful for taking off richer solution before vacuum filtration. For slime the best treatment is by filtration, and for general use the adoption of decantation would be a backward step, however helpful it may be in special cases or in combination with filtration."

So far as we can gather the general view held by the more advanced and responsible South African metallurgists is quite opposed to the "Engineering and Mining Journal's" suggestion. Filter practice has become part and parcel of the metallurgical practice of modern Witwatersrand treatment plants, and whatever may be said in favour of decantation, it seems altogether improbable that in the Transvaal and Rhodesia the filtration of slime will be superseded by variations of the methods of other days. The whole subject is of such importance to South Africa, where slime treatment is a most vital operation of the gold mines, and the effect of the famous Moore judgment is likely to be so far-reaching that we have quoted our contemporaries at some length. The subject of continuous decantation is referred to in another article which appears in this issue.

City and Suburban.

The following are the results of operations at the City and Suburban for January:—Tons milled, 27,300; gold recovered, 12,428 fine ozs.; profit, £22,721.

THE MANAGER AND STAFF OF THE NEW HERIOT G.M. CO., LTD.



Bottom Row—Left to Right: F. J. Wilson, compound manager; R. Meyer, mine surveyor; J. Arthur, reduction officer; J. B. Holgate, mine secretary; Clement Robinson, general manager; W. Arnison, mine captain; S. Masters, resident engineer; P. von Wildenrath, chief electrician; E. O. Durrant, assayer.
Middle Row—Left to Right: P. Arthur, foreman blacksmith; P. Croft, shift boss; A. Barling, cyanide foreman; C. H. Gunnatt, foreman carpenter; J. P. Courtis, foreman fitter; R. Bawden, shift boss; W. T. Harrison, shift boss; S. F. Worstfold, sampler.
Top Row—Left to Right: A. J. Wilson, native hospital attendant; G. C. Saddler, acting timekeeper; E. L. Harris, acting storekeeper; E. L. Adams, assistant surveyor; A. Glenshaw, clerk.

MODERN AMERICAN MILLING PRACTICE.

All Sliming Processes in America—The New Continuous Decantation—The Moore-Clancy Process.

[By HUNLEY ST. JOHN BROOKS.]

It has been said, perhaps with a good deal of justice, that modern American milling and cyanide practice has been largely developed in Mexico, and certainly to the metallurgists of Mexico the credit is due for some of the most widely adopted innovations in the cyano-metallurgy of gold and silver ores. The American metallurgist, however, though owing a great deal to the work of his brethren south of the Rio Grande, has levied on every mining country in turn for the equipment of his latest mills. To the Rand he owes the modern high-duty stamp, to Westralia the tube-mill, to New Zealand the Brown agitator, or, as it is called on the other side, the Pachuca tank, from having been first introduced to American practice at Pachuca in the Mexican State of Hidalgo. He himself has brought vacuum filtration and zinc dust precipitation to their present high state of commercial efficiency, and is also responsible for the Moore-Clancy and the continuous decantation processes, both of which are being very much discussed just now on the other side of the Atlantic.

To-day the typical Mexico-American mill is an all-sliming one, and is practically continuous down to the filters. In most big mills these are of the Butters or Moore type. Very many of the smaller mills, however, are installing continuous filters of the Oliver or Hunt type, with a considerable saving in first cost and also in skilled labour for operation. This is especially an advantage in those out of the way districts in Central America, Mexico, Korea, etc., where skilled white labour is hard to get, and often hard to keep. A native, once broken in, can be trusted to run a continuous automatic unit under the occasional supervision of the shift-boss, but it is necessary to have a white man on the cycle filters, whether vacuum or pressure.

Cycle vacuum filters are, in my opinion, the most suitable for large plants where white labour is plentiful, while for very large tonnages of quite low-grade slime, the Merrill pressure filter has almost the field to itself. These filters, which discharge their residues without opening the press, were designed by Merrill, of the Homestake, to treat the extremely low grade slimes of that mine at a profit. They have since been successfully adopted at other mines in the States and elsewhere, where similar conditions obtain. A continuous filter, such as the Oliver, would, however, be ideal for the smaller plants of Rhodesia and the outlying districts of the Transvaal. An objection has been urged in some quarters that the continuous filters do not give a perfect wash, and that consequently the dissolved values in the residues are unduly high. This is true enough where the filtered solution is rich in gold, but in that case it is simply necessary to dewater down to say 1 in 1 ahead of the filter, and break down the dewatered pulp with precipitated solution. This, largely reducing the solution value of the filter pulp, keeps the dissolved value of the washed cake down to a sufficiently low figure. The percentage of extraction of the dissolved values of any filter cake is obviously a function of the permeability of the cake and the duration of the wash. It is, of course, impossible in a continuous filter of the drum or Oliver type, or of the horizontal Ridgeway-Hunt type, to give the prolonged wash that is often employed with the discontinuous type of filter. It is, however, only a matter of installing dewaterers ahead of the filter to keep the dissolved values in the residues down to any figure desired.

ZINC DUST PRECIPITATION.

In the Americas zinc dust precipitation is gradually gaining the day over the old familiar zinc shavings. Zinc dust had to encounter a good deal of prejudice at first, mainly on account of one or two rather bad failures with the process in Mexico, and to this day your old-fashioned cyanide man shakes his head when the claims of the newer system are urged. Troubles with zinc dust in the past have been wholly

due to trying to precipitate unclarified solutions, improper or irregular feeding of the zinc dust emulsion, or to omitting to give the dust sufficient contact with the pregnant solution before entering the presses. With properly clarified solutions and a properly designed filter press (such as the Merrill), zinc dust will precipitate any solution that shavings will, and will do its work with greater economy and with less risk of tampering and from fire. When the Gold Fields Consolidated mill was burnt down in 1910, thousands of pounds worth of bullion were recovered from the Merrill presses after they had cooled down, though previously jets of flaming zinc had been spouting from the connections. Had zinc shavings been employed there can be no doubt that most of this bullion would have been lost.

DORR THICKENERS AND CONTINUOUS DECANTATION.

Most of the recent innovations in milling practice on the other side have been mechanical rather than chemical ones. One may cite the employment of batteries of Brown agitators connected in series, thus converting agitation from an intermittent into a continuous process; the gradual replacement of cones by mechanical classifiers of the rake or screw type for classifying and dewatering ahead of the tube mills, and the introduction of continuous dewatering of the Dorr type for dewatering ahead of the agitators and filters. These machines, with a negligible power consumption, dewater slime from 6 or 8 to 1 or more down to 1 in 1 or less; giving a continuous clear overflow to the precipitation department and a thick underflow to the agitators or filters as the case may be. So successful have they proved in practice that it has been proposed to do away with filtration altogether for those gold ores that when slimed yield readily to cyanidation, and simply to pass the tube-mill produce through a battery of, say, four continuous thickeners. The overflow from each thickener would be precipitated, and the underflow broken down to about 4 to 1 with barren solution and thence to the second thickener, where the process would be repeated. The number of thickeners would naturally depend upon the richness of the ore, but it is claimed (and I think with reason) that by aiming to obtain the bulk of the extraction in tube-mill circuit, and only using the agitators to finish the extraction, the greater part of the gold can be taken out of the mill circuit ahead of the agitators, and that what values remain can be reduced to so low a point after passing through the fourth thickener that the effluent will hardly pay to filter. This scheme of treatment, which was first proposed by Ferdinand McCann, towards the end of 1909, has already been adopted with success in at least three mills in the State of Colorado, and is now being installed by the Globe and Phoenix for their new plant at Que Que, Rhodesia. Continuous decantation, as the process has been termed, has been energetically opposed on theoretical grounds by several American metallurgists. It is urged that there will be a difficulty experienced in obtaining a homogeneous mixture of the highly thickened pulp from a given thickener with the precipitated solution required to break this pulp down to say 4 to 1. In practice, however, it has been found that, to obtain a mixture homogeneous enough for all practical purposes, it is sufficient to let the thickened underflow and the added solution flow down a steep launder well, provided with baffles. It has also been urged, and here the point is, I think, better taken, that continuous decantation would be a step in the wrong direction, as it would involve the precipitating of large bulks of solution, in some cases up to 11 tons of solution per ton of ore. However, precipitation on a large scale with zinc dust costs surprisingly little nowadays, while pumping charges do not bulk largely, especially where, as is so largely the case in the Americas, hydro-electric power is employed. Given a suitable ore, it seems to me the whole thing resolves itself into a question of com-

mercial efficiency. In some environments it will pay to keep the bulk of pregnant solution as low as possible, then if the heads be rich, an intermittent filter of the leaf type is indicated. In other localities the precipitation of an extra bulk of solution counts but little in comparison with the possibility of cutting out filter costs. In such circumstances I think continuous decantation has a future before it.

THE MOORE-CLANCY PROCESS.

The Moore-Clancy process was introduced to the metallurgical world in 1911 by the Moore Filter Co. As readers of the *S.A. Mining Journal* are aware, it has been claimed that practically any gold or silver-bearing ore, not containing copper, can be cyanided by the process with an almost complete solution of the precious metal and a complete regeneration of the chemically consumed cyanide. The process, briefly, consists of agitating the ore at -100 mesh with a solution containing about .05 per cent. Potassium Cyanide, .1 per cent. Potassium Thiocyanate, .1 per cent. Calcium Cyanamide, and .025 per cent. Potassium Iodide. During agitation the pulp is electrolysed at a pressure of some 5 to 6 volts. Some 15 iron oxide electrodes 3ft. long by 3in. diameter are sufficient for a 50-ton charge, a current of about 50 amp. per ton of ore treated being required. The iron treatment tank is used as a cathode. About eight hours agitation is needed, .005 per cent. to .01 per cent. protective alkalinity being maintained. At the end of this time the

p.a. is raised to .05 per cent., and the current is passed for a further two hours to regenerate the cyanide. The pulp is then sent to a Moore filter plant and the values recovered in the usual manner.

The Moore-Clancy process is at present being employed by the Victor and other mills in Colorado, and the patentees have recently completed an installation at Cobalt, Ontario. A very similar process has long been successfully employed by the Portland Mill in Oregon. I am informed, however, that considerable work remains to be accomplished towards perfecting the mechanical details of the process before it will attain to complete commercial success. There is no doubt, however, that many ores hitherto untreatable without roasting can and will be successfully treated in the near future by the Clancy process.

A great deal of quiet, painstaking work has been accomplished by a San Francisco metallurgist during the past year, bearing on the problem of preparing a stable cyanide of an organic base of low molecular weight. The object is, of course, to prepare a cyanide which would cost no more to produce than sodium cyanide, but which, having a much lower molecular weight than NaCN, would, bulk for bulk, be very much more active than the latter salt. The advantages of such a discovery, especially to mines where transport is high, are obvious. I am sure we all hope that in due course we shall have some definite pronouncement on this matter from the city of the earthquake and fire.

TRANSVAAL PROSPECTING PERMITS AND CLAIMS.

Some Remarkable Declines—Figures Classified.

A STATEMENT just published by the Union Department of Mines shows there were further declines in prospecting operations in the Transvaal, as judged from the number of prospecting permits in issue, and, moreover, further contraction in the number of claims held in this Province during the final half of last year. As to the former we find that at the 31st December, 1911, 925 permits were in force, at the end of June last there were 814, whilst during the last six months of the year there was a remarkable reduction, only 582 being in issue at the end of December. The official statistics for the various mining districts are as under:—

District.	Prospecting Permits.		
	Dec. 31, 1911.	June 30, 1912.	Dec. 31, 1912.
Johannesburg	166	114	93
Krugersdorp	6	2	3
Boksburg	3	2	2
Heidelberg	10	16	28
Klerksdorp	78	39	34
Ottoshoop	10	36	32
Pretoria	23	23	28
Barberton	249	230	152
Pilgrim's Rest	138	136	82
Pietersburg	242	216	128
Totals	925	814	582

Similarly as to claims the figures are as follows:—

	Total Claims.		
	Dec. 31, 1911.	June 30, 1912.	Dec. 31, 1912.
Johannesburg	17,670	17,397	17,241
Krugersdorp	20,066	17,959	17,520
Boksburg	30,568	26,234	25,013
Heidelberg	10,193	10,206	6,988
Klerksdorp	5,315	3,322	2,896
Ottoshoop	658	698	767
Pretoria	—	11	211
Barberton	13,396	14,079	14,725
Pilgrim's Rest	7,124	7,139	6,717
Pietersburg	60,216	53,966	46,177
Totals	165,226	151,011	138,255

In view of the continued, and, one might well say, increased activity in the districts of Pilgrim's Rest, Barberton, the Zoutpansberg and the Waterberg, these figures are surprising. A closer analysis shows that the claims held may be classified according to (a) Prospecting; (b) Diggers; and (c) Base Metal. Taking the three periods the returns stand as follows:—

Prospecting:

December 31, 1911	89,577
June 30, 1912	79,796
December 31, 1912	73,272

Diggers:

December 31, 1911	10,005
June 30, 1912	10,474
December 31, 1912	10,817

Base Metals:

December 31, 1911	65,644
June 30, 1912	60,741
December 31, 1912	54,166

In so far as base metals are concerned an increase from 7,274 (December, 1911) and 8,530 (June, 1912), to 9,515 (December, 1912) in the Barberton district is to be noted. The increase in regard to diggers' claims is almost entirely due to more claims being registered under this heading in respect of the Johannesburg, Krugersdorp and Boksburg districts.

Jumpers-cum-Treasury.

The following is the result of the joint working of the Jumpers and Treasury Mines during January:—60 stamps, working 25 days, crushed 6,100 tons, yielding 1,686 ozs. fine gold from mill, 850 ozs. fine gold from tailings by cyanide, 259 ozs. fine gold from current slimes, and 455 ozs. fine gold from accumulated slimes; total from all sources, 3,250 ozs. fine gold. Value of the output, £13,652. Joint profit for the month, £2,024. Position of joint gold reserve at end of month, 696 ozs. fine gold.

GOLD-SILVER ORE TREATMENT IN 1912.*

Review by Mr. Alfred James.

WE desire to tender to our contemporary, the *Mining and Scientific Press* of San Francisco, our congratulations on having produced an annual review number well befitting the conclusion of an eventful year in the annals of the mining industry. The number now before us is a bulky production, which reviews the progress and research of 1912 from Australia to Alaska, from the Pacific slopes to the Far East. The articles have been written by experts and throw the light of specialised knowledge on many aspects of the great industry of mining. In this issue we print the first instalment of a noteworthy and instructive article by Arthur James on progress in gold-silver ore treatment during 1912. We may be pardoned for stating that the author refers at some length to articles that have appeared in our own journal. Mr. James has much that is of vital interest to say concerning the Witwatersrand. Particularly would we direct attention to his remarks about the paucity of practical result of the Mines Trials Committee's work.

COSTS.

It is singular that for the present year, as in 1906, fine sliming and the treatment of slime have still been the main centres of interest. It is difficult to believe that details of practice determined so long since, and even then capable of producing records not since materially modified, remain of chief interest. Readers of this review may have noticed that since 1906 costs have no longer been a feature in it; this is for the simple reason that they have not yet been notably bettered, at any rate at the mines then referred to. Thus in 1906 rock-breaking was stated to amount to 1.71d. per ton at the Lake View, and 1.87d. at the Ivanhoe. At the latter mine the figure for the past year has been 3.93d. Milling at the Ivanhoe was 1s. 9d. per ton; it is now 1s. 8d. Roasting was 2s. 4d. per ton at the Great Boulder; it is now considerably higher. It would be interesting to know if the so-called improved furnaces are really improvements, and, if so, why they cannot beat the Great Boulder 1906 record of 2s. 4d. per ton on roasted sulpho-telluride ore. Cyaniding by agitation was then 1s. 4d. per ton at the South Kalgurli, including 7d. per ton for KCN; has this cost for agitation treatment been since bettered locally? Dehne filter-pressing at 1s. 6d. has been undoubtedly cheapened, both in Africa and Australia, to 10d. and 1s., but the Ridgway filter, at that time stated to be giving high recoveries for 4d. per ton, is still pre-eminent with its total cost of 1d. per ton on a million tons of low-grade pulp and 2d. per ton on high-grade pulp (value say £3 to £4 sterling) not usually treated direct in filters of the submerged vacuum type. It would be as well to again collate costs; old figures become stale, and I shall welcome notes of actual cost per ton handled for crushing, milling, tube-milling, cyanidation of sand, cyanidation of slime, agitating, vacuum-filtration, and filter-pressing. It is a solace to think, however, that in spite of increased costs, the percolation of 1 dwt. sand is still carried on at a profit.

GENERAL TENDENCIES.

A feature of the year has been the reported closing down of the last surviving chlorination plants. The expression at the World's Columbian Exposition twenty years since, "Cyanide is king," has surely been amply justified. A practice probably doomed to speedy disappearance is that in Africa of having separate sets of vats for the collecting and possible preliminary leaching of the sand prior to the main treatment. If the new Rand mills, such as the Geduld, be considered, it will be found that reliance is placed on a single set of vats, and this surely is justified by the results of the Princess and East Rand plants. At the latter E. H. Johnson shows some of the highest extractions on the Rand.

Decantation, too, is dead as a process to be adopted at new mills. These are all designed for filtration. Indeed, it is only too evident that Africa is awakening from the benumbing mechanical influence that, up to recently, seemingly confined its metallurgical aspirations to the better preparation of the sand for leaching, and the feeling of satisfaction with local standards is giving way to the keen desire to know more of the successful work of American, Mexican, and Australasian confreres in the solution and recovery of the precious metals, and to adopt such methods locally. This the Rand has now in active harness its F. L. Bosqui in addition to its W. A. Caldecott and E. H. Johnson, W. R. Dowling and M. Torrente; Rhodesia, which has ever been on the alert, has brought over A. W. Allen from Mexico, in addition to its many celebrated specialists, and even recently sent one of its Australian experts to Cripple Creek to decide some point of advanced practice in which it wished to indulge. This is surely as it should be. The day has gone when men of note can go to New Zealand, Australia, Mexico, and the United States, and come back only to decry what they have seen. Surely the better the expert the greater his capacity for recognising what is good in outside practice.

Generally, progress for the year has been along developed lines, with no brilliant surprises. Possibly the work of our friend Charles Butters at the Nipissing (to be referred to under "Amalgamation"), is the most daring technical exploit of the year.

CHANGES ON THE RAND.

On the other hand, owing to the attractiveness of the newer practice of tube-milling to -200-mesh, simple class classification, air-agitation, slime-filtration, and zinc-dust precipitation, it has been easy to lose sight of steady progress on other lines, such as is evidenced in the design and construction of the mill of the Roodepoort United Main Reef G.M. Co. At a period when new mills on the Rand were under a cloud (relieved later, it is true, by the starting up of the Brakpan and Modder B), the Roodepoort mill demonstrated how heavy stamps and high duty could be combined with economy in design, in power, and in working costs. Even the huge and carefully-planned Randfontein mill, with its cleverly designed scheme for handling ore, must yield in attractiveness to the Albou mill, in which may be noted the soundness of the judgment which has enabled S. H. Farrar, F. Bulkeley, and M. Torrente to avoid extravagances noticeable elsewhere and yet to include just those things (big steel bins, almost vibrationless heavy stamps, tube-mills of large diameter and specially determined length with simple linings, and tailing-wheels) which make it one of the most cheaply operated mills on the Rand. Why should local engineers put in power-eating centrifugal pumps with most costly monthly renewals (£60 per month or more), with uneven delivery of pulp to the spitzkasten, and with an awkward tendency to go wrong with coarsely crushed pulp, when tailing-wheels at less than £10 per month for repairs do all the work with a steady flowing discharge on even the coarsest crushed material?

The Roodepoort mill crushes 20 tons per head per day, and does this readily with only one feeder per battery. This mill is stated to operate for 14 kw-kr. per ton for everything from breaker stations to clean-up and blacksmith-shop, as against the 23 to 30 kw-kr. stated to be usual in African practice. In other words, it crushes and beneficiates 1,000 tons of ore per day with 700 h.p., and a peak load under 1,000 h.p. The mill consists of 100 stamps of 1,900 lb., only 50 working. The tube-mills are 6ft. in diameter and 16ft. long. Stamping costs 11d. per ton. Milling (complete), including sorting, crushing, stamping, tube-milling, amalgamating, and retorting (everything up to the cyanide plant) costs 1s. 6d. per ton.

The group (Albou) responsible for this mill is also responsible for many of the improvements in Rand practice, including the Denny Bros.' abandonment of long (30-day) percolation of coarse stand particles, the introduction of tube-mills, and of the filtration of slime; and it has thus demonstrated that keenness to investigate and adopt new methods (proved elsewhere) may go hand in hand with economy in first cost and in working expense coupled with large outputs and low power bills. Undoubtedly, up to the present the Roodepoort mill may be regarded as the best example of a modern mill on the Rand of the type general to the field; that is, without air-agitation or slime-filtration.

But, as stated above, this type of mill is now moribund. S. H. Pearce, at the latest Crown Reef mill, takes the precaution of a final air-agitation for his slime prior to filtration in the Butters filter, which has produced so great a change in Rand methods. E. H. Johnson, at the East Rand, was one of the first to approve of filtration and the first to adopt continuous agitation in Pachucas. But the "Doctor" of the Rand must be F. L. Bosqui; one almost fears to state how low the Bantjes recovery was before he took it in hand, or how great an improvement he has effected in City and Suburban results. African 95 per cent. total recoveries have always compared most favourably with those obtained elsewhere. Mr. Bosqui has been evening up the laggards, in one case by recovering increased gold from the slime, and in another case by adopting more modern methods for the treatment of the coarse classified sand.

While writing of Africa, I cannot but wonder at the paucity of practical result of the Mines Trials Committee's work. Local inventors have from time to time declaimed its methods, but the industry may well ask the reason for there having been so little fruit for so much effort; so little result in an industry obviously decadent in solution and recovery methods, until the arrival of fresh blood from America infused fresh energy. The Mines Trials Committee recommends relatively large payments to local promoters of tube-mill cones, nozzles, feed, or lining ideas; but what has it done to encourage foreign inventors to bring in the fresh ideas so much needed in the industry? The Nissen stamp has been forced to a successful issue by an outside group, only by the aid of the unwearied and continuous attention of the inventor, who went to the expense of jeopardising his other interests by residing on the Rand. But the amount of business up to the present given by the Rand to the inventor will probably not pay his travelling expenses, and if ever the Nissen stamp is adopted by the Rand at its mills yet to be designed, it will be because of the enterprise of Rhodesia in widely adopting it.

Whatever the standpoint of the industry, it may be confidently asserted that any non-publication of results on the ground of communicating useful ideas to non-contributors is a most suicidal policy. Have the contributors really benefited in any single point? The fact is that the secrecy of the committee avoids that effective criticism which alone can lead to the highest and best results. Let the committee either be disbanded or reorganised, with power to immediately publish the results of its investigations.

*Extracts from an article appearing in the Annual Review number of the "Mining and Scientific Press," San Francisco.

THE PILANDSBERG VOLCANO.

A Post-Waterberg Eruptive Mass—Plutonic and Effuse Rocks Piercing the Bushveld Laccolite—Geological Age Somewhat Indefinite.

IN the last annual report of the Geological Survey there appears a description, by Dr. Humphrey, of the Pilandsberg, which, from its geological features, is one of the most interesting areas in the Transvaal. "The outstanding topographical feature of the area," says Dr. Humphrey, "is the mountain group of the Pilandsberg, of which the highest peak reaches an elevation of 5,521 feet, or some 2,000 feet above the general level of the surrounding country. This group has an almost circular outline, whose diameter varies from 15 miles from north to south to 18 miles measured from east to west. The outermost rim of the group consists of a very steep, broken and boulderclad range of kopjes often forming a continuous and inaccessible ridge which shuts in the Pilandsberg proper on all sides. Through this outer wall the various streams which rise within the circle have cut their way, forming more or less broad gaps, which form a natural passage for roads and footpaths. Within this encircling wall is found a second range parallel to the first whose continuity is broken only by the stream valleys above referred to, and separated from it by a more or less wide valley along the northern and western portion of the circle, while to the east and south this valley is less well marked. The outer circle of hills is composed of holocrystalline deep-seated rocks, the inner circle being a succession of lavas and porphyrites. Within the latter is a massive development of deep-seated rocks similar in character to those forming the outermost rim with occasional thick cappings of effusive rocks forming high hills. The highest point in the mountains, on which stands a beacon of the Trigonometrical Survey, is situated on the second range of hills composed of lavas and porphyrites. The regularity of this concentric arrangement of ridges is somewhat broken by the broad valley formed by the Rhenoster Spruit, which rises on the eastern slopes of the inner western containing wall and breaks across the ridges in succession, finding its outlet into the surrounding flats on the farm Rhenosterspruit No. 609. Its tributaries occupy a rule subsidiary valleys, which follow the softer geological horizons and coincide more or less roughly with their strike. It drains practically the whole of the central portion of the Pilandsberg, although several of the other streams have to a certain extent cut back through the range of lava hills."

GENERAL GEOLOGICAL STRUCTURE.

The general geological structure is described as follows: "The whole of the area under review, with the exception of a few isolated kopjes composed of quartzite, is covered with igneous rocks; they belong partly to the Igneous Complex of the Bushveld and partly to the Pilandsberg alkali-rocks. We have here the most westerly development in the Transvaal of the Red Granite, the Bushveld synclinal basin becoming shallower to the west and only the more basic modifications of the magma, usually forming the peripheral zone, are present. Thus the eastern portion of the area is covered to a great extent with granitic rocks, while in the western portion noritic and pyroxenitic types are found. Against the extreme western portion of the Red Granite rises the mountain mass of the Pilandsberg, which is in contact with the granite for some twelve miles. On all other sides these rocks are bounded by norite and pyroxenite. The volcanic mass of the Pilandsberg proper forms the chief interest of the area. It consists of a series of holocrystalline, dyke, and effusive rocks of two main types. One of these consists of plutonic and effusive varieties rich in soda, and having nepheline and aegerine as important constituents. The other type consists principally of alkali-felspars, in which neither nepheline nor aegerine is common, being generally entirely absent. Upon close examination these rocks are seen to be part of the very much denuded remnants of a great volcano, with a central core of plutonic

material surrounded by a massive development of lavas and porphyrites in which the dip is almost invariable from the central portion towards the circumference. An outer rim of plutonic rocks similar to those forming the central portion has been laid bare by the denudation of the overlying lavas, the original extent of which must have been vastly greater both in height and area covered than is seen to-day. The norites and pyroxenites occupying the rest of the area are of the normal type. The formations represented in the present area are as follows:—Sedimentary: Pretoria Series: Quartzites and Shales. Igneous: Bushveld Igneous Complex: Granite; Norite and Pyroxenite. Pilandsberg Alkali-rocks: Plutonic: Red Syenite; Nepheline-Syenite. Effusive: Trachytes, etc.; Phonolites, etc.; Tuffs and Breccias. . . . None of the developments of rocks of the Pretoria Series are in their normal position, but belong only to the uppermost horizons, viz., the Magaliesberg Beds. As shown in a previous report over the stretch of country between the Pilandsberg and the Marico River the Upper Magaliesberg beds are missing from the normal sequence of the Pretoria Series, and occur as isolated masses and groups of hills surrounded by rocks belonging to the Bushveld Igneous Complex. The norite intrusion here took place beneath the Upper Magaliesberg beds instead of above them, as in other parts of the country. Consequently these latter were broken up and partially submerged in the igneous magma and occur in isolated masses. All the outcrops to be considered belong to these various detached portions of the Magaliesberg beds."

THE PILANDSBERG GROUP.

"As before mentioned, the rocks comprising the Pilandsberg are disposed in a circular form, consisting roughly of two principal concentric ranges enclosing an inner central mass. These rocks are of two principal groups, namely, plutonic and effusive. The plutonic rocks are distributed throughout the Pilandsberg, but more especially in the central portion of the area, where they crop out over considerable areas on Boekenhoefffontein No. 889, Nootgedacht No. 749, Leeuwfontein No. 429, etc. They also form the outermost encircling ridge, which, on the south-western side of the Pilandsberg, has a surface width of some three and a half miles. This width varies, and on the whole diminishes when the ridge is followed round the circle in either direction until on the north-eastern side of the mountains it does not measure more than a few hundred yards. On this side, however, the effusive rocks attain their greatest development and have been invaded extensively by plutonic material. The effusive rocks are developed in their turn principally in the form of a huge circular outcrop, which lies within the outermost ridge just mentioned. The thickness of this effusive facies varies, but reaches its greatest development on the farm Vaalboschlaagte No. 636 and Doornpoort No. 231 where the surface width of the outcrop measures some five miles. This dwindles gradually as one follows the strike either way, and on the farm Tussenkomst No. 331 measures less than a mile across. In addition to this main development of effusive rocks they are found also in the central portion of rocks of plutonic origin. They also follow a well defined subsidiary line along the northern edge of the mountains separated from the main mass by a thick intrusion of plutonic rocks. The very regular way in which the plutonic and effusive rocks are on the whole distributed, and also the fact that the masses of effusive rocks dip with very few and merely local exceptions away from the centre outwards is exceedingly suggestive, and points to the fact that we have to deal here with a great centre of volcanic activity, if not with the remains of one stupendous volcano and its subsidiary peripheral vents. Tuffs and volcanic breccias are of frequent occurrence. The plutonic rocks to be described vary considerably. They all, however, bear the character of syenites, and can be roughly

divided into three classes as follows, each being developed principally in one particular area:—(1) Red Syenite; (2) Foyaitite and Lujaurite; (3) Nepheline Syenite."

In his concluding remarks, Dr. Humphrey observes: "An interesting fact is, that while the massive wall-like range of plutonic rocks which surrounds the effusives on the outer margin of the mountains consists of foyaitite types along the south and south-west, their place seems to be taken by red syenites to the west, north-west, and east of the Pilandsberg. In the central portion the foyaitite occupies all the area to the north-east, while red syenite is developed on the south-west. These two rocks thus seem to be developed in these mountains along exactly the same lines, and yet each is confined to its own localities, which it dominates to the exclusion of the other. This points to the fact that these types represent similar phases of plutonic activity in relation to the other rocks of the neighbourhood. The red syenite intrusion was anterior to that of the foyaitite, and each type has its own related effusive equivalents. The classification of the effusive rocks and the elucidation of their particular relationships to the two plutonic types of nepheline syenites (free from nepheline) are questions of considerable difficulty. This is partly due to the fact that intimately associated with the true lavas, volcanic breccias, and tuffs is a series of porphyrites which graduates, through all the types between extruded lavas and intruded sheets and dykes. These now form one unbroken series, and to pick out the effusive equivalents belonging to each of the above two closely related types of deep seated rock and map them separately would be a petrological task requiring much time; and a more detailed examination than has been possible of the field relationships of the various members of this effusive complex would be necessary. There can be no doubt that the group of hills comprising the Pilandsberg represents the remnant of what was once an important focus of eruption. The perfectly regular circular arrangements of the lavas and their almost invariable outward dip lead to this conclusion, rather than to the alternative of a series of volcanic cones scattered over the area. Tuffs and volcanic breccias are found all over the areas where the effusive rocks are developed, and perhaps this is most noticeably the case along the outermost ring of lavas which are developed on the north and west. They are also found in the central mass among the effusives which cap the big mountain on the farm Buffelspan No. 585. It is of course quite possible that there were subsidiary peripheral vents and cracks from which lava flowed, but considering the tremendous amount of denudation which has taken place nothing can be said in that respect with any certainty. The broad band of red syenite and foyaitite, which now encircles the whole, probably represents a portion of the original magma from which the lava issued either along these supposed peripheral vents, or connected with the main mass which, in the course of the formation of the volcano, gradually intruded into the lower and earliest accumulations of cooled and consolidated effusive rocks. With the gradual degradation of the mass these portions have been laid bare; the lavas, which must have extended far beyond them around the periphery of the volcano having entirely disappeared. The two main types of syenites here dealt with probably represent the two main

phases of the activity of the volcano. The section through the lavas along the Rhenoster Spruit gives scarcely any types in which nepheline is abundant, and aegerine is not found at all until the porphyrites underlying the banded lavas are reached. This would point to the fact that the trachytic lavas corresponding to the alkali syenites (red syenites) were extruded from vents, which continued open principally towards the east, while the second and later series of eruptions found a vent principally towards the west and north where the aegerine and nepheline lavas are most freely distributed. The comparative freshness of these rocks as compared with the former might also perhaps point to the same conclusion as to their relative age. It must be pointed out that the area is one of extreme complexity, and only the main outlines and outstanding features of the complex have been dealt with. These, however, are very clear in pointing to the main results deduced above. At the same time, as is well known, this type of alkali and nepheline rocks is always rich in abnormalities; and this area is no exception to the rule. From the point of view of the petrologist in particular a detailed examination of the various lavas and of the red syenites is a field in which there remains ample scope for work, and to the student of vulcanicity there are many problems of interest which would repay further research. With regard to the age of these rocks and of this volcano as compared with the red granite, Transvaal System and Waterberg System, several important conclusions can be drawn. Assuming the correctness of the theory that the Bushveld Igneous Complex is the remains of a laccolite, which was intruded between the Transvaal System and the Waterberg System at some period posterior to the laying down of the Lower Waterberg rocks, it is evident that the denudation of the rocks forming the roof of the laccolite must have represented a very considerable time, and that this denudation was completed in this neighbourhood, before the Pilandsberg effusions took place is most probable, from the fact that no Waterberg rocks are found underlying the lavas at any point. In fact on the north-east of the area the effusive rocks still extend to within a few hundred yards of the surrounding red granite, and at no point along the periphery of the mountains are the Pilandsberg intrusive rocks found in contact with any other than those belonging to the Bushveld Igneous Complex. Consequently, it seems that between the intrusion of the Bushveld laccolite, and the formation of the Pilandsberg volcano, a period of time must have elapsed sufficient for the complete degradation and disappearance of the sedimentary roof of that laccolite. This may have taken place in this area while the Upper Waterberg beds were being deposited elsewhere, or the Upper Waterberg beds may have formed part of the rocks denuded. In either case it seems most probable that this lapse of time would be sufficient to place the Pilandsberg volcano subsequent to the whole of the Waterberg System. There is no evidence available by which these rocks can be compared as to age with those of the Karroo. These lavas are in no way similar to the Drakensberg volcanic rocks, nor have the eolite-syenite dykes, connected with the Pilandsberg, yet been traced into areas where their relationship to rocks of Karroo age could be studied. The only evidence available therefore places them as post Waterberg."

S.A. Gold Trust.

Lord Harris, presiding at the annual meeting of the South African Gold Trust, Ltd., this week, dwelt on the strong position of the company. He pointed out that the object of the reserve was to provide for rainy days. These had come, so they were justified in drawing on the reserve. They would, however, replace the reserves when good times returned. As long as the trade boom continued the speculative markets would remain in their present lamentable state, but there were signs that trade had reached high-water mark, and sooner or later the depression would be removed. He pointed out that gold was being absorbed in such quantities, especially by the East, that the output was again becoming digestible. He also stated that three-quarters of the year's depreciation was in Rand invest-

ments. Referring to labour on the Rand, Lord Harris stated that it was likely to become more plentiful. The amalgamation of the groups was working well, and at present the Consolidated Gold Fields was getting more nearly its complement of labour than it had ever done. He considered that but for the removal of the Chinese the position of the low grade mines might be quite different. They never had enough labour to provide all the ore the mill could treat. He announced that most encouraging reports concerning the position in Rhodesia had been received from Mr. Birkenruth. The Chairman concluded by saying that though West Africa was disappointing, they were by no means despondent. An alteration in the conditions, such as the cost of labour, might some day make a great difference.

Rhodesian Section.

LATEST MINING NEWS.

Southern Rhodesian Imports—London and Rhodesian Mining and Land Company—The Chishawasha Tin Field—Subsidence at the Giant—Shamva Developments—Position at the Hanover—Planet Arcturus—Matabele Queens—Footage and Values at the Cam and Motor—The Connemara—Rhodesia Central G.M. Co.—Katanga Copper Sales.

THE total imports into Southern Rhodesia during the past twelve months have been officially declared by the Statistical Bureau in Capetown at £2,969,958, as compared with £2,975,112 in 1911. The exports for the corresponding years were respectively £3,181,998 and £3,098,400. The exports were, as usual, almost entirely composed of various minerals, the different items reading as under:—

	1912.		1911.	
	Quantity.	Value.	Quantity.	Value.
Asbestos (lbs.)	68,788	£348	556,019	£2,768
Coal (tons) ...	28,291	13,605	5,752	3,558
Diamonds (carats)	493	2,051	305	1,034
Gold, Raw (ozs.)	759,065	2,626,631	760,302	2,544,077
Gold, Slag or Concentrates (lbs.)	3,569,261	53,730	4,182,269	52,980
Ores:				
Copper (tons) ...	48	1,084	4	1
Chrome Iron (tons)	68,818	154,601	53,499	118,064
All other ...	—	320	—	83

The foregoing figures, it will be seen, read satisfactorily enough, all the items of mineral export showing an increase—in the cases of coal and chrome ore a quite substantial increase—with the single exception of asbestos, which latter is only awaiting better transport facilities.

The Board in London of the London and Rhodesian Mining and Land Co. recently received the following details of work on their claims in Rhodesia:—Radnor: West shaft, timbering nearly completed, headgear erected, boilers and winch installed; 100 ft. level, samples from west drive off shaft No. 1 assaying 18 dwts. per ton over 80 ins., length 125 ft. South crosscut off west drive at 15 ft. in assaying 1 oz. 10 dwts. per ton over 27 ins. South crosscut off west drive at 56 ft. in assaying 3 dwts. 4 grs. per ton over 60 ins. Newman: Have cut a reef 12 ins. thick at 52 ft. in lower than adit showing visible gold, assay results later on. Downton: Main adit driven 12 ft., total 147 ft.; expect to strike reef at 152 ft. Montezuma: Total footage driven and sunk for December is 53. Shall be able to increase footage for January; will start sinking as soon as sufficient labour available. 117 ft. level, west drive, drive extended 6 ft., a total of 255 ft.; reef 45 ins. wide assaying 1½ dwts. South cross-cut off east drive at 120 ft. east exposed 9 ft. ore assaying 8½ dwts. 210 ft. level, east drive extended 6 ft., total 35 ft.; reef 41 ins. wide assaying 1 oz. per ton.

According to the Salisbury correspondent of the *Rhodesian Mining Review*, Mr. W. P. Fisher and Mr. J. R. Williams, who have been in Salisbury for the last fortnight, have put in a good deal of time on the Chishawasha tin claims, and, from all one can learn, are quite satisfied with the results of their operations. These have been proceeding now for some six months, and a large amount of ground has been opened up. That there is a lode goes without saying, and a very big one too. But the question to be determined is as to the value of this ore-body. It is not claimed for it that it is a high-grade proposition, though the view entertained by its owners and their advisers is that it bids fair to ultimately turn out to be a payable proposition. Anyway, there is no present intention to close down; on the

contrary, operations are being vigorously continued, and on a large scale. In other words, the prospect continues to be encouraging.

The London secretary of the Giant Company stated in mail week that a cablegram had been received from the consulting engineers stating that a subsidence had occurred affecting the pillars above No. 6 level, which might lead to a loss of a certain amount of ore. The engineers stated that they hoped to maintain the output in the neighbourhood of 10,500 tons per month. A later message stated:—Main shaft absolutely unaffected by subsidence. A further cablegram gave the following new development figures:—Main drive at 728 ft. south assaying 5 dwts. 10 grs. per ton over 68 ins., remainder of little value. Crosscut 614 ft. south at 20 ft. east assaying 5 dwts. 10 grs. per ton over 60 ins., east cross-cut off south drive at 725 ft. south first 5 ft. 3 dwts. 12 grs.

The local office of the company has sent to the London office of the Shamva Mines, Ltd., a cablegram informing them that the crosscut on the 4th level has exposed, so far, 20 feet of reef averaging 14½ dwts., and that the reef is continuing in both faces.

It is understood that the Hanover, North, Teutonic and other claims, the property of the Hanover G.M. Syndicate, which was until recently under option of purchase to the Consolidated Goldfields group, have now been handed back to the Syndicate, who have again started crushing operations. There are said to be good grade ore reserves on the property to the extent of some 9,000 or 10,000 tons.

The Board of the Planet-Arcturus G.M. Co. issued a statement in mail week stating that development at the mines continues extremely satisfactory. At December 31, ore reserves were over 190,000 tons, valued at 15½ dwts., all development faces showing very favourably. At the end of September the figures were 150,756 tons of the average value of 15·9 dwts.; and at the end of June last, 115,400 tons (including "prospective" ore) of the average value of 16·5 dwts.

At the end of December last the ore developed at the Matabele Queens mine totalled 31,680 tons, of an average assay value of 10·2 dwts. Operations are greatly hampered by water shortage, practically no rain having fallen on the property this season. The management, however, are now laying a pipe-line to some claims three and three-quarter miles away, from which it is hoped to secure sufficient water for the mine's needs for some time to come. Developments underground are thoroughly satisfactory. Driving is being carried out on the 5th and 6th levels, and cross-cutting is proceeding on the 7th level, where it is expected to cut the reef shortly.

The following is the copy of a cablegram which was recently despatched to the Board of the Cam and Motor in London:—Total footage driven and sunk for December is 459 ft. No. 4 level east crosscut of south drive at 250 ft. south from shaft No. 1 driven crosscut 20 ft. From 10 ft. to 15 ft. value of the ore is 8½ dwts. per ton. No. 5 level at 330 ft. south from shaft No. 1 west crosscut driven a

further 11 ft., total 47 ft.; average value 8½ dwts. for 21 ft. At shaft No. 1 winze sunk 41 ft., total 152 ft., reef 69 ins. wide, assaying 9 dwts. per ton. No. 6 level main south drive, drive driven from shaft, drive extended 112 ft., total 329 ft.; from 217 ft. to 247 ft. of little value, and from 247 ft. to 329 ft. assaying 11 dwts. per ton over 58 ins. Cross-cuts east and west at 263 ft. south proves payable width 9 dwts. over 38 ft.

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We understand that work on the Connemara mine has now practically been concentrated on the proving of the sulphides. Hitherto operations have been confined to the oxidised zones, with the results of which the management are quite satisfied. To the end of December 179,384 tons of oxidised ore had been developed from a reef 15 ft. in width, giving an average assay of over 7 dwts. per ton. Over and above this, however, is 3,461 ft. of strike which has yet to be opened up, though at several points prospecting shafts have been sunk, and at each spot the reef shows payable values. The management are awaiting results of developments in the sulphide zone before finally deciding on the plant with which the mine is to be equipped.

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The manager of the Rhodesian Central G.M. Co. recently reported as follows on recent developments:—Emerald Isle

property: No. 3 shaft sunk further 6 ft.; width of reef still averages 35 ins., panning 8 dwts. No. 1 level, still driving; width of reef 39 ins., panning 10-11 dwts. Alexandra property: Have again sampled reef in workings; average panning 20 dwts.; trial crushings and tailings substantiate values; check assays average 27.5 dwts.; ore from rich chute assaying 130.66 dwts., not included in the above; work proceeding satisfactorily; rainy season commenced.

* * * *

Messrs. Maus and Co., the Antwerp brokers in metal and ores, sold on January 7, by inscription, some 350,100 kilograms of Katanga copper, smelted at the Lubumbashi works of the Union Minière du Haut Katanga. According to the particulars supplied, the ingots contained about 95.15 per cent. of copper, about 3.10 per cent. of cobalt, and 0.76 per cent. of sulphur, and about 0.74 per cent. of iron. One hundred thousand kilograms were sold at 182 francs 25 per 100 kilograms. Messrs. Maus also state that though the copper quotations are lower now than last summer, the demand is still very great. They add that last year the Union Minière offered for sale at Antwerp 1,985,000 kilograms of copper, smelted at their Lubumbashi works. According to the Brussels *Echo de la Bourse*, some 650,000 kilograms of copper, smelted at the Lubumbashi, are now either at Beira or already en route from Beira to Antwerp.

Rezende Mines.

The following are particulars of the output for the month of January, 1913, showing a total profit of £2,529, made up as follows:—*Rezende Section*: Tons milled, 3,800, total ozs. fine gold recovered, 1,477; estimated value of yield (gold and silver), £6,332; estimated profit after deducting London expenses, £1,267; add revenue from tributors, £549; estimated profit from Rezende Section, £1,816. *Penhalonga Section*: Tons milled, 5,100; total ozs. fine gold recovered, 957; estimated value of yield (gold, silver and lead), £5,124; estimated profit from Penhalonga Section, £713. Total estimated profit, £2,529.

Globe and Phoenix.

The Secretary of the Globe and Phoenix Gold Mining Company has issued the following circular:—"Early in October last the Board was approached on behalf of certain Scottish shareholders with the view to the appointment of an additional Scottish director. At a subsequent interview with Mr. E. A. Davidson, when he suggested Mr. J. C. Pitman as a suitable director, the Board stated that they saw no reason to increase the number of directors, and they were not then satisfied that Mr. Pitman would command general support in Scotland. Since that date Mr. Leslie has unexpectedly resigned, and the Board has been satisfied that Mr. Pitman has the general support of the Scottish shareholders. The Board has, therefore, elected Mr. James Campbell Pitman, Advocate, of Edinburgh, to fill the vacancy created by the resignation of Mr. Leslie. "In connection with the representations made to the Board in October, the question of directors' fees was raised, when the directors stated that they were willing to meet the wishes of the shareholders on this point, and decided voluntarily to forego a considerable part of the fees due to them under the articles of association. A formal statement of their action will be embodied in the annual report. The attention of the Board has been called to circulars dated the 17th December, 1912, and the 18th January, 1913, signed by Messrs. Turnbull, Paton and Porter. From the above it will be seen that the statements in the circular of the 17th December with regard to the attitude of the directors in the matter of fees were not justified. The further statements are equally misleading, and will be dealt with when the directors next meet the shareholders. Any shareholders who have given support to the above signatories are therefore advised to withdraw it. Mr. Sharpe, for whom the signatories to the circular are seeking a seat on the Board, has no share qualification. The Board is informed by Mr. Davidson that he is not in any way associated with the circular of the 18th January, and that the references to him are unauthorised and quite inaccurate."

WANTED.

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Mining and Minerals.

In his report for 1911, the Magistrate of Mafeking reported no improvement in mining. The Madibi Mines has practically closed down. The Port Elizabeth Madibi Co. had decided to go into liquidation. A little prospecting had been done on the Crown land known as Wodehouse Kraal, and at Kraaipan, in the Setlagoli Native Reserve but the results had not been encouraging. In Rietfontein in the Kalahari, there were favourable diamondiferous indications, including the presence of a fissure, as well as considerable deposits of carbon, garnets, and olivines. In Hopetown the prospecting for diamonds had resulted in only surface stones being found. In Herbert there were two proclaimed alluvial diamond diggings, on which approximately 60 Europeans and 200 coloured persons worked. In Kuruman asbestos mining had not proved a success owing to the patchy occurrence and the expense of transport. The alluvial mining diggings experienced a boom owing to diamonds to an amount of £10,900 being found during the year.

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THE SOUTH AFRICAN SCHOOL OF MINES AND TECHNOLOGY, JOHANNESBURG.

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Further particulars may be obtained by applying to the School (Postal address: Box 1176, Johannesburg).

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Miners and Mine Inspectors.

To the Editor, *South African Mining Journal*.

Sir,—I want to protest on the surface—because it is too dangerous and expensive to protest underground—against the manner in which the Mining Regulations are enforced against the miners by the mining inspectors. This is not a protest against the Regulations; it is a protest against being insulted and patronised and talked at by a public servant as if I was an ignorant, irresponsible hireling (his hiring). The scandal and unfairness of choosing all mining inspectors—in this country—from a class which has no sympathy with the miners is so obvious that it would not be tolerated even in Great Britain. The other day the mine captain came into my stope and said he was pleased to see it was so well watered—decidedly better watered than the regulation required. He explained the object of the regulations was to prevent dust, and the place should be watered until dust was impossible. The directions in the regulations giving the distance on each side of a machine which must be watered was (in his opinion) only a silly way of hinting one way of keeping down dust in a stope. Soon after he went I was visited by a mining inspector, accompanied by an admiring friend. I watched him examine the stope microscopically. He then stopped all work in the stope, and the following interesting conversation took place: "Has the shift boss been here this morning?" "Yes." Then to show me how little he thought of the word of a common miner he insulted me by asking a Kaffir the same question right in front of my face. "Are you in charge of these machines?" "Yes." Then dramatically he placed his finger tip in a crevice and showed it me covered with as much dust as he would have found in any corner of the Palm Court of the Carlton Hotel. "That is dust," he said, "and that is what I am paid to prevent, and what I am determined to prevent." I longed to tell him that if he intended to fine me, why not fine me?—but that I objected to be talked at like an overgrown school kid who has dirtied its nice clean bib, though, as this would have cost me a fiver, I let him yap. He then asked why a certain hole was not plugged. I said I did not consider it was on the bench the machine was working at. He then said, "You are an experienced miner; you don't think you could be humbugged, do you?" I said I thought that there were no class of men in the world who were being humbugged more than the Rand miners were to-day. He said, "Well, I have been a mine captain; you cannot humbug me." As if the fact of having been a mine captain was an absolute guarantee of his practical efficiency.

He then sneered at the newness of all my plugs, and said someone must have told me he was coming. "But I warn you to be careful; I shall probably be here again when you least expect it." And this from a man who I suppose had never been on a tour of inspection down a mine without giving the agents of the capitalists twenty-four hours' notice of his coming. He then told me I had had a very narrow escape, and then gave the shift boss (who had appeared on the scene) a long lecture on his duties, and told him to "run me" on the very first opportunity. During the whole of this kindergarten performance all work in the stope was stopped. The shift boss, who was very young and very earnest, seemed much impressed by the inspector's lecture, and he promptly ran me two days after for not watering the hanging wall. In his anxiety to please the inspector by making an example of me, he forgot that the regulations do not require the hanging wall to be watered, so I got off. But I had to walk four miles to be tried and four miles back, and as I did not feel inclined to walk another four miles back to the mine to go on night

shift I missed a shift, so lost money through the ignorance of a mine official and idiosyncrasy of a mine inspector—though I was not fined.—Yours, etc.,

MINER.

February 10, 1913.

A Critic on Rand Mining.

To the Editor, *South African Mining Journal*.

Sir,—I find it very difficult to take mining on the Rand seriously to-day. There has never been a period when experience without influence has been of less use to an underground worker. There has never been a time when more brains have been employed or less commonsense. Why? Because the qualities and the training required to make a really reliable underground boss are so different to the qualities and the training which the modern mine official receives. The majority of our mine officials to-day are not trained on a mine, but in a college. The conditions under which the training is carried out is carefully arranged to prevent monotony and discomfort, and to keep the student interested in his work. After a successful course of this kind of thing, a young man has only to prove himself energetic—for a short period in a mine—when he is considered quite good enough to become the boss of a shift—if he has influence. He is no miner—he never will be one—but he is shoved into a position where, if he cannot direct and advise all kinds of underground workers, he can be of no practical use to the mine as a boss. The average School of Mines man, if he is not quickly made a mine official underground, soon loses all interest in underground work; to him there is nothing in it but drudgery—he goes back to his white collar.

College training does not give the ability to apply the sustained effort in monotonous disagreeable work month after month and year after year which is necessary before the skill, resource, and experience are obtained to become a leader of men underground. It is not as if these modern mine officials had any other superior and useful knowledge of the work not possessed by the workers. A surveyor does their surveying and measuring; the assayer and sampler's work point out to them where to obtain a regular output. Any experienced timberman knows better than they do how to keep a place safe. The pumpmen, tracklayers, pipe-fitters, trammers, skipmen, machinemen, and handstoppers have forgotten more about their respective jobs than their bosses are ever likely to learn. No one but a beginner would ever do more than pretend to listen to a School of Mines man's advice. So that the only duties which they can carry out intelligently consist of seeing that the drives are kept clean and that there is no dust about, and that the holes are plugged—duties which require the instincts of a housemaid. She has to see that the passages and corridors are kept clean, and that her rooms and working places are free from dust, and as for the plugging of holes, I feel sure the miners would carry out such work for a housemaid much more willingly than for any mine official on the Rand to-day.

I have known college-bred shift-bosses who have chucked their housemaid duties in disgust and have tackled mining in earnest, with the object of becoming really competent to hold down a boss's job underground. But it's a big mistake to do this if a man wishes to improve his position underground (as some of them have told me themselves). First of all, to their surprise, soon after they start to try and earn a living as a miner, they begin to see things in a totally different light. They find that by far the greater part of their drawbacks and loss of efficiency is not caused

gh their own ignorance, but through the rotten management and defective organisation of the nincompoops in charge of the mine. Being pushers, and having no respect for the bosses, they start to grouse in no uncertain manner, soon find themselves looking for work and wandering about out of jobs—for all the world, and in every respect, the men whom they have always looked down upon as ignorant, ignorant, irresponsible miners: those men on whose broad shoulders all the faults of Rand mining are fully placed by the white collar brigade in the technical circles. But suppose they have the grit to get through the very difficult and trying period. They have now the education, intelligence, and *experience* necessary to make a good mine official, but when they try to get back to shift (without influence) they will find it ten times more difficult than when they had just left college. The hard fact is the modern mine official does not want such under him; he is afraid of them. He has every reason to be. To illustrate the ridiculous position of things under the present system we will reverse the situation. Suppose some lunatic had a school for golf with model clubs and model balls on a model golf course in his studio. Imagine a miner, passing with honours through his indoor golf course, regarding himself an expert golf player, competent to teach and criticise men who had learnt their game in the open. What Homeric laughter he would cause at all the "Ha, ha! dear boy; awfully funny. Damned wrong telling me my grip and my stance are all wrong. I am sure he ought to know, because he passed with honours in the damned school room. Eh! what? What are the work-classes coming to?" Yes, the vials of ridicule would

be poured on that miner's head, but in what respect he would be more ridiculous than the modern mine official I cannot see. It is want of experience which makes these amateur miners reduce wages first, when they are driven to reduce costs (or make room for someone else who will). By reducing wages they impoverish the whole community, but it is such an easy thing to do nowadays when there are three men hanging around the headgear for every vacancy. With the usual exceptions, these mines are managed underground to-day with less skill than they have ever been. The underground economies of the last few years have been effected principally by taking advantage of the helplessness of the workers and the penury of the unemployed. If the men in charge of these mines were as skilled as they should be, Johannesburg would be far more prosperous, and the foreign shareholder would still get his pound of flesh.

MINER.

February 14, 1913.

ANSWERS TO CORRESPONDENTS.

- "G."—Your charges are being investigated in the proper quarters.
 "Shareholder."—Both syndicates are in liquidation, and there is nothing for the shareholders.
 "Inventor."—Address the G.M.E., Mines Department, Johannesburg.

REVIEW.

Gold and Mine Surveying. By George Lionel Leston. London: Messrs. Crosby, Lockwood and Son. 362 pp. 6s. net.

Books on surveying are already so numerous that the want of another work on the same subject may, perhaps, be scarcely worthy of special reference. The book under review, however, has sufficient merit of a special kind to make it desirable that the attention of students should be directed to it. As the author remarks, there is no book dealing with the application of surveying to mining purposes that quite meets the requirements of mining students; the existing works are too elementary, and still more deal with the subject in such a manner that only experienced surveyors can properly understand them. Mr. Leston, who, besides being a mining engineer and surveyor, is a certificated colliery manager, has had the mining experience in view while writing his book, and has endeavoured to deal with those points which are usually found difficult. The work has numerous illustrations and diagrams, and, in every way, it seems to attain the author's object in a fairly simple way. The operations described, as far as they relate to mining, refer mainly to colliery surveys, but as there is so much that is of general application and use, this advantage is one that is of little importance. The book is up-to-date, and covers its subject admirably.

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City Deep.

The following cable has been despatched to London:—"For publication. Appeal Court at Capetown has to-day given judgment in the case of Federation Co., Limited, versus Bezuidenhout and others, dismissing the Federation Company's appeal with costs. The action of the Federation Company against the City Deep, Limited, is based on the same contentions as those involved in the appeal just decided. City Deep case set down for hearing 14th March."

Worcester G.M.

The Worcester Gold Mining Company's report for January shows the following:—Tonnage crushed, 5,300; yield from mill, 650'826 ozs.; yield from cyanide, 362'498 ozs.; total yield, 1,013'324 ozs., valued at £4,251 5s. 10d. The approximate profit for the month was only £400, as owing to urgent repairs to the main shaft, the mill only ran for twenty-three days.

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THE JANUARY OUTPUT IN DETAIL.

Record in the History of the Transvaal by 9,728 ozs., Value £41,322.

Total output	789,390 ozs.
Value	£3,353,116
Increase	12,984 ozs.
Value	£55,154
Rand output	760,981 ozs.
Value	£3,292,440
Increase	15,121 ozs.
Value	£64,227
Outside Districts	28,409 ozs.
Value	£120,676
Decrease	2,137 ozs.
Value	£9,073
Total stamps	10,009
Increase	3
Rand	9,540
Increase	100
Outside	469
Decrease	97

The gold output for the Transvaal for January was declared by the Chamber of Mines to be 789,398 ozs. of fine gold, of the value of £3,353,116, which is an increase of 12,984 ozs., value £55,154, on the December return. The January return constitutes a record in the history of the Transvaal by 9,728 ozs., value £41,322, the previous best having been for May in last year, when the gold produced amounted to 779,662 ozs., value £3,311,794. The Witwatersrand production for January of 760,981 ozs., value £3,292,440, shows an increase of 15,121 ozs., value £64,227, over December, which is highly satisfactory coming as it does immediately after the December increase over November of £77,145. January's yield from the Rand is therefore a record of 14,033 ozs., value £59,607, over the highest previous return, which was for May, 1911, when 746,948 ozs. value £3,172,833, were produced. Outside districts show a decrease of 2,137 ozs., value £9,073, the major portion of which is attributed to miscellaneous producers, their aggregate returns being less by 25 per cent. than for December. In the Witwatersrand returns there are three notable increases—Crown Mines with over £21,000, East Rand Proprietary with over £16,000, and Nourse Mines with nearly £10,000. These advances being the result of past preparatory work, may be expected to be maintained.

LABOUR.

There is an increase for January of 7,876, according to the Witwatersrand Native Labour Association figures compared with December, on the total employed on gold, coal and diamond mines. There is an increase on gold mines of 8,774, and an increase on coal mines of 155, while diamond mines decreased their complement by 1,053. The figures for the past three months of the numbers employed by members of the Witwatersrand Native Labour Association at the last day of each month read:

	November.	December.	January.
Gold	186,881	191,316	200,090
Coal	8,767	8,634	8,789
Diamonds	14,872	14,965	13,912
Totals	210,520	214,915	222,791

THE STAMP POSITION.

The stamp position for the whole of the Transvaal shows an increase of 3 compared with December. Outside districts return a decrease of 97, and the Rand an increase of 100, showing a small balance of increase as above. The details of the changes are: Rand: Increases—Bantjes, 5; Con. Langlaagte, 10; Con. Main Reef, 10; Ferreira Deep, 5; Knight Central, 5; Randfontein Central, 50; Robinson Deep, 20; Simmer Deep, 15; total, 120. Decreases—Jupiter, 5; Miscellaneous, 15; total, 20; increase, 100. Outside districts:

Decreases—Sub Nigel, 10; Sheba Rosetta, 20; Miscellaneous, 72; total 102. Increase—Sheba, 5; total, 97; net increase, 3.

THE FIRST DOZEN COMPANIES.

The following are the details of production of the twelve leading companies:

	Stamps.	Tube Mills.	Tons Crushed.	Value.
Crown Mines	660	25	190,000	£298,879
Randfontein Central	800	29	225,923	273,741
East Rand Proprietary	820	25	165,100	263,066
Ferreira Deep	225	6	54,980	113,852
Robinson	250	6	56,600	101,669
New Modderfontein	180	7	51,600	99,235
Rose Deep	300	7	69,000	98,254
Brakpan Mines	150	8	59,130	91,112
Nourse Mines	260	7	53,000	84,564
Geldenhuis Deep	300	7	54,800	82,644
Knights Deep	400	9	111,230	82,070
Simmer and Jack... ..	320	7	76,400	80,996

Totals 4,495 143 1,168,713 £1,670,082

GROUP PROFITS.

The following are the profits returned for November, December and January by the mines controlled by the different groups:

	November.	December.	January.
Rand Mines (Eckstein)	£230,714	£256,107	£280,347
Rand Mines (Subsidiaries)	237,210	256,589	176,281
Gold Fields group	110,527	115,221	107,419
Robinson group	102,146	106,225	102,156
East Rand Proprietary	90,502	94,654	95,693
Barnato group	73,339	77,391	79,198
General Mining group	63,802	70,551	66,262
Neumann group	55,834	54,281	43,085
Cons. Mines Selection	41,059	41,222	39,115
Kleinfontein group	23,869	24,642	23,496
Goerz group	1,315	10,859	15,417

INCREASES AND DECREASES.

The following returns of the December output have been filed with the Chamber of Mines. Increases and decreases compared with December are appended:—

The Witwatersrand.

	Dec. £	Jan. £	Inc. £	Dec. £
Aurora West	18,588	19,472	884	—
Brakpan	91,020	91,122	102	—
Bantjes	37,847	38,599	752	—
Cinderella Con.	26,697	25,291	—	1,406
Con. Langlaagte	51,941	58,338	6,397	—
Con. Main Reef... ..	34,237	34,513	276	—
City Deep... ..	77,759	79,989	2,230	—
City and Suburban	51,304	52,791	1,487	—
Crown Mines... ..	277,653	298,874	21,226	—
Durban Roodepoort	15,071	15,010	30	—
Durban Roodepoort Deep... ..	37,711	38,361	650	—
East Rand Proprietary... ..	246,513	268,066	16,553	—
Ferreira Deep	114,897	113,852	—	1,045
Geduld	19,238	19,709	471	—
Geduld Deep	76,846	82,644	5,798	—
Ginsberg	21,485	21,978	493	—
Glencairn	16,978	18,371	1,393	—
Luipaardsvlei	17,934	17,883	—	51
Jupiter	42,205	39,869	—	2,336
Jumpers-cum-Treasury	13,669	14,519	850	—
Knights Deep	80,694	82,070	1,376	—
Knight Central	30,528	31,616	1,088	—
Lancaster West	21,566	21,137	—	429

	Dec. £	Jan. £	Inc. £	Dec. £	Company.	Tons Milled.	No. of Stamps.	Total Gold obtained, Fine Ozs.	Total value.
Langlaagte Estate	61,422	61,983	561	—					
der B.	63,448	61,184	—	2,264					
n Reef West	25,983	28,494	2,511	—	Meyer and Charlton...	14,467	75	7,597	32,270
Consolidated	14,871	15,211	340	—	Modderfontein "B" ...	35,100	80	14,404	61,184
er and Charlton... ..	31,242	32,270	1,028	—	New Goch	28,000	120	6,627	28,150
Goch	27,304	28,150	846	—	New Heriot	11,630	70	4,798	20,381
Kleinfontein	70,903	70,924	21	—	New Kleinfontein ...	51,000	210	16,697	70,924
Modder	103,149	99,235	—	4,214	New Modderfontein...	51,600	180	23,362	99,235
Primrose	35,736	36,165	429	—	New Primrose	25,000	160	8,514	36,165
Rietfontein	19,493	18,966	—	527	New Rietfontein Estate	16,200	120	4,465	18,966
Unified	16,817	16,838	21	—	New Unified	12,010	60	3,964	16,838
se Mines... ..	74,743	84,564	9,821	—	Nourse Mines... ..	53,000	260	19,908	84,564
Heriot	20,882	20,381	—	501	Princess Estate	22,600	60	6,852	29,105
ess	27,908	29,105	1,197	—	Robinson	56,600	250	23,935	101,669
nson Deep	73,150	71,808	—	1,342	Robinson Deep	27,900	160	16,905	*71,808
Report United	29,823	30,452	629	—	Randfontein Central ...	225,923	800	64,444	273,741
Deep	93,858	98,254	4,396	—	Roodepoort United M.R.	28,178	50	7,169	30,452
nson	106,045	101,669	—	4,376	Rose Deep	69,000	300	23,131	98,254
fontein Central..	268,975	273,741	4,766	—	Simmer Deep	61,350	155	12,540	*53,267
mer Deep	48,403	53,267	4,864	—	Simmer and Jack	76,400	320	19,068	*80,995
mer and Jack	88,370	80,996	—	7,374	Spes Bona Tribute	6,325	40	1,581	6,716
Bona	6,461	6,716	255	—	Van Ryn Gold Mines ...	40,120	135	13,154	*55,875
lstruis Estate	14,833	16,107	1,274	—	Village Deep... ..	50,500	180	18,112	76,935
ge Deep	73,596	76,935	3,339	—	Village Main Reef... ..	41,200	220	18,068	76,748
Ryn	54,715	55,875	1,160	—	Vogelstruis Estate	12,138	70	3,792	16,107
Rand Consolidated ...	45,455	43,900	—	1,555	West Rand Central... ..	1,614	20	816	3,466
atersrand	47,515	49,316	1,801	—	West Rand Consolidated	30,050	100	10,335	43,900
Deep	52,778	54,001	1,223	—	Witwatersrand	39,670	220	11,610	49,316
Rand Central	3,245	3,466	221	—	Witwatersrand Deep... ..	37,800	245	12,713	54,001
uter	36,747	36,836	89	—	Wolluter	27,400	120	8,672	36,836
ellaneous	24,081	19,713	—	4,371	Miscellaneous Producers...	—	—	4,611	19,713
Increase, £64,227.									

Outside Districts.

ett	1,113	650	—	463
ns Lydenburg	6,488	8,194	1,706	—
... ..	20,155	20,143	—	12
Nigel	9,748	8,385	—	1,363
a	14,234	13,877	—	357
vaal G.M. Estates ...	40,959	42,656	1,697	—
ester	5,265	4,303	—	1,062
ellaneous	30,032	22,468	—	7,564
Decrease, £9,073.				

OUR MONTHLY TABLE.

The following is our usual monthly table:—

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained, Fine Ozs.	Total value.
ja West... ..	14,394	80	4,584	19,472
jes Consolidated	27,500	100	9,087	38,599
pau Mines	59,130	150	21,152	91,122
Deep	42,700	150	18,831	79,989
and Suburban	27,300	150	12,428	52,791
erella Consolidated ...	19,390	80	5,954	25,291
Langlaagte Mines... ..	44,510	100	13,734	58,338
olidated Main Reef ...	21,798	100	8,125	34,513
n Mines	190,000	600	70,302	298,879
an Roodepoort... ..	14,050	90	3,555	15,101
an Roodepoort Deep ...	25,800	100	9,031	38,361
Rand Proprietary... ..	165,100	820	61,931	263,066
ira Deep... ..	54,930	225	26,803	113,852
nhuish Deep	54,800	300	19,456	82,644
erg	14,515	80	5,174	21,978
airn Main Reef	21,320	160	4,325	18,371
ld Proprietary Mines ..	14,200	50	4,640	19,709
er	41,850	100	9,386	*39,869
pers-cum-Treasury ...	6,100	60	3,418	*14,510
lts Deep... ..	111,230	400	19,321	82,070
ht Central	27,300	115	7,443	31,616
aster	9,975	100	4,976	21,137
laagte Estate	55,105	200	14,592	61,983
ardsvlei Estate... ..	17,650	60	4,210	17,889
Reef West	19,546	90	6,708	28,494
Consolidated	14,140	100	3,581	15,211

HEIDELBERG—

Nigel	13,800	75	4,742	20,143
Sub Nigel	4,855	20	1,974	*8,385

BARBERTON—

Barrett	—	—	153	65
Sheba-Rosetta	382	20	399	1,695
Sheba	4,850	60	3,267	13,877
Worcester Exploration	5,300	40	1,013	4,303

LYDENBURG—

Glynn's Lydenburg	3,702	20	1,929	8,194
Transvaal G.M. Estates ...	15,848	75	10,042	42,656
Miscellaneous Producers...	—	—	5,289	22,468

*Van Ryn does not include 7 ozs. value £30, taken from reserve; Jumpers include 167 ozs., value £708, taken from production and added to reserve; Jupiter does not include 500 ozs., value £2,124, taken from reserve and declared in output; Robinson Deep does not include 600 ozs., value £2,549, taken from reserve and declared in output; Simmer and Jack does not include 355 ozs., value £1,508, taken from reserve and declared in output; Simmer Deep does not include 500 ozs., value £2,124, taken from production and added to reserve; Sub Nigel does not include 300 ozs., value £1,274, taken from reserve and declared in output.

Goerz Group.

The following are the results of operations of the crushing mines comprising the Goerz Group for January:—

Company.	Stamps.	Tons.	Value.	Profit
May Consolidated	100	14,140	£15,176	£4,069
Princess Estate	60	22,000	28,994	1,952
Lancaster West	100	9,975	21,053	4,642
Geduld Proprietary	50	14,200	19,662	4,754
Totals	310	60,915	84,885	15,417

Tube mills working: Princess Estate, 5; Lancaster West, 3; Geduld Proprietary, 2; total 10. The Lancaster West yield includes final clean up, from which estimated £10,500 gold obtained. Costs cover expenditure for the whole month till crushing stopped, though work in the mines ceased on the 11th of January.

THE WEEK IN THE SHAREMARKET.

Quiet and Waiting—Paris Still Selling.

DESPITE the record gold output and the improving labour returns, the market has shown a drooping tendency this week; the possible prolongation of the trouble in Turkey is doubtless the immediate cause of the apathy. The closing down of the Rand Klip was, of course, not unexpected, though it was hoped that an effort would be made further to test the property. Tin shares continue to evoke some demand, and diamonds are being watched in view of the good market for the stones. None of the new diamond ventures, however, have yet "made good."

* * * *

From London we learn that Chartered are still being dealt in heavily for option account, and it is evident that some big operators scent a coming movement. Gold shares that will be most prominent as activity increases include Planet-Arcturus, Cam and Motor, Shamva, Eldorado, and Lonely. The squabble regarding Globe and Phoenix is unfortunate. Apparently, the Scotch dissenters from the policy of the Board have begun to dissent among themselves. Of the Development companies attention is given to Gold Fields Rhodesian Development, Willoughbys, Amalgamated Properties of Rhodesia, and Transvaal and Rhodesian Estates. Diamond shares have been strong and active, and De Beers Deferred have registered the biggest individual advance of any share in the mining list; Premiers are also much favoured, while there has been a consistently good demand for Roberts Victoria.

* * * *

	Friday. 7th.	Sat. 8th.	Monday. 10th.	Tuesday. 11th.	Wednesday. 12th.	Thurs. 13th.
African Farms ..	17 9	17 9	17 9B	17 9B	18 0	17 6
Apex Mines ..	27 6B	27 0	26 6B	27 0S	26 0B	26 6
Aurora West U. ..	10 0B	—	10 0B	—	—	10 0B
Bantjes Consolidated	24 0B	—	24 0B	24 0	—	—
Benoni Consolidated	4 1A	4 0B	4 0	3 6B	3 9B	4 0
Blaauwboosch Diam.	92 6B	95 0B	95 0	95 0B	97 6	97 6B
Brakpan Mines ..	85 0S	—	85 0S	85 0S	84 0B	84 3B
Breyten Collieries	31 6B	31 6B	31 6B	31 0B	32 3S	31 6B
British S.A.	—	26 9B	—	26 3B	26 3B	26 0B
Bushveld Tins ..	0 10B	0 10B	0 10B	—	0 11B	0 11B
City & Suburbans ..	45 9B	47 0	46 6B	47 3	47 0	46 9B
City Deeps ..	64 6B	64 6B	64 9B	65 0B	65 6	64 6B
Cloverfield Mines ..	7 3B	7 3	7 3	7 3	7 0	6 10B
Clydesdales ..	8 6B	8 9B	8 6B	—	8 6B	—
Cons. Investment ..	—	—	—	—	22 0B	—
Cons. Langlaagtes	29 6B	29 6	29 6B	29 6	29 9S	29 0B
Cons. Main Reefs ..	20 9B	20 6B	21 0	21 3B	20 3	19 3
Cons. Mine Select.	12 9B	14 0S	14 0S	—	13 0S	13 6S
Coronation Colls. ..	17 0S	—	—	—	—	—
Coronation Freeholds	0 6B	0 6B	—	—	0 9S	—
Coronation Synd. ..	3 6B	3 6B	—	—	—	—
East Rand Centrals	11 3B	11 6	11 6	12 0	11 3	11 6S
East Rand Coals ...	2 2	2 2B	2 2B	2 2B	2 2B	2 1B
East Rand Deeps ...	2 10	—	2 10B	2 9B	—	2 9
East Rand Debs ...	£92B	£92B	£92B	£92B	£92B	£92B
East Rand Props ...	58 0B	58 0B	58 0B	58 6	58 0	57 0B
Eastern Gold Mines	2 0B	2 0B	2 0B	2 0B	2 0B	2 0
Frank Smith Diam.	11 6B	11 9	11 9B	11 9B	11 9	11 9B
French Rands ..	—	—	—	1 6B	2 3B	—
Geduld Props.	23 9B	—	23 9	23 9B	23 6B	23 0B
General Minings ..	—	—	—	21 0B	21 0B	—
Glencoe (Natal) Colls.	—	—	6 0B	—	—	6 0B
Glynn's Lydenburgs	—	—	—	—	—	23 0S
Government Areas	22 6	21 9B	21 9	21 9B	21 6B	21 3B
Hex River Expls. ...	0 9	0 6B	0 9	0 9B	1 0B	1 0B
Jupiters ..	11 9	11 6B	11 6B	11 6B	11 6B	11 6B
Kaalfontein Diam.	—	0 6	0 8B	0 7S	0 8S	0 5
Klerksdorp Props.	3 0S	2 10B	—	2 10B	3 0S	2 9B
Knight Centrals ...	13 3	13 0	13 3	13 0B	12 6B	12 6B
Knights Deeps ..	—	—	—	—	42 6B	—
Lace Props.	4 0B	4 2B	4 3	4 1B	4 2	4 2
Langlaagte Estates	—	—	—	—	—	25 0B
Luipaardsvlei Est.	—	—	—	8 0B	10 0S	—
Lydenburg Gold Fms	2 6B	2 7B	2 7	2 7B	2 6B	2 7B
Main Reef Wests ..	18 0B	18 0B	18 6B	18 3B	18 3B	18 3B
Meyer & Charltons	—	103 0B	104 0B	—	105 0B	106 0B
Middlevlei Estates	1 4B	1 3B	1 4B	1 3B	1 6B	1 3S

B Buyers.

S Sellers.

	Friday. 7th.	Sat. 8th.	Monday. 10th.	Tuesday. 11th.	Wed. 12th.	Thurs. 13th.
Modder B's ..	72 6	72 0B	—	72 6B	72 0	72 6B
Modder Deeps ..	35 0B	37 6B	38 6	38 9S	38 6S	36 6B
Natal Navigation Col.	16 3B	—	—	—	—	—
New Boksburgs ..	1 3B	—	1 3B	1 3B	1 3B	—
New Eland Diam.	30 0S	28 0*	31 0S	28 6B	29 0	—
New Eras ..	8 3S	7 9B	7 9B	7 10B	7 9B	8 0B
New Geduld Deeps	2 8B	2 8B	2 8B	2 10	2 9B	2 9B
New Kleinfonteins	21 6	—	21 9	21 9B	22 0B	21 6B
New Rietfonteins ..	6 9B	7 0	6 6B	7 0B	7 0B	7 0B
New Unifeds ..	15 6B	—	15 0B	—	—	—
Nourse Mines ..	—	—	—	37 6B	37 6B	—
O.F.S. & Nam. Dia.	1 10B	—	1 9B	1 9B	1 11B	1 11B
Paardekraal Estates	0 6B	0 6B	—	0 6B	0 6B	—
Potchefstroom Est.	1 0B	1 0B	—	—	—	—
Premiers Def. (2/6)	230 0B	233 9B	230 0B	230 0B	230 0B	—
Premier Pref. (5/4)	170 0B	170 0B	170 0B	170 0B	170 0B	170 0B
Pretoria Cement Co.	53 0S	—	53 0S	53 0S	—	53 0S
Princess ..	8 9B	8 9B	8 6B	8 9B	8 6B	8 6B
Rand Collieries ..	6 6B	—	8 6B	8 6S	8 0S	—
Rand Klips ..	3 6B	3 7	3 0	2 8	2 3B	2 3
Rand Nucleus ..	3 0B	3 0B	3 0B	3 1	3 0B	—
Randfontein Deeps	5 9B	—	6 3S	5 9B	5 9B	6 0S
Randfontein Estates	30 6B	30 9	30 6B	31 0B	31 0B	31 3
Roberts Victoria ..	43 9B	—	43 9B	—	—	142 6
Robinson Deeps ..	40 6B	41 0B	41 0	42 6B	41 0B	43 9S
Roosburg Minerals	34 0	34 0B	34 0B	34 3	34 9	35 9
Rooipoort Durban	—	—	—	—	—	—
Deeps ..	24 0	—	—	—	—	—
Rydenpoort U.M.R.	13 0B	13 0B	—	13 0B	—	—
Ryan Nigels ..	3 6B	3 6B	—	3 6B	3 6B	—
Salisbury ..	—	—	—	—	—	—
Shebas ..	5 6B	5 6B	—	5 6B	—	5 9
Simmer Deeps ..	2 6	2 6B	—	2 6B	—	—
Solomon's Temple	—	0 8B	0 8B	0 9B	—	0 9B
S.A. Breweries ..	40 6B	41 0B	41 0B	41 0B	—	41 0B
S.A. Lands ..	4 6B	4 5	4 4B	4 5B	4 3B	4 3B
Springs Mines ..	15 3B	15 6	15 3B	15 0B	15 9	15 0B
Sub Nigels ..	12 0B	12 6B	12 3B	13 0	13 3B	13 3
Swaziland Tins ..	—	34 0B	—	—	—	—
Trans. Coal Trusts	48 0	48 0	48 0S	48 0B	48 0B	47 6B
Trans. Cons. Lands	28 0B	29 6B	29 0B	29 0B	29 0B	29 0B
Trans. G.M. Estates	56 0	56 3B	—	56 0B	56 6B	55 0B
Tudors.	2 0S	2 0S	—	—	—	—
Van Ryn Deeps ..	23 9	23 6B	24 0	24 3B	24 6	23 9
Village Deeps ..	42 0B	42 0B	43 0	43 3B	42 6B	43 0B
Vogel. Cons. Deeps	2 3B	2 3B	—	2 0B	—	—
West Rand Cons. ...	14 9B	14 0B	14 0B	14 6B	14 3B	14 0B
West Rand Estates	3 6B	3 10B	3 9B	—	4 0B	4 0B
Witbank Collieries	46 0	45 6B	46 0B	—	—	—
Witwatersrand ..	61 0B	61 6B	62 6B	62 6B	63 0B	61 0B
Wit Deeps ..	54 9B	54 6B	54 6B	54 0B	54 6B	54 6B
Wolhuters ..	18 0B	18 0B	18 0B	18 0B	18 0B	—
Zaaiplaats Tns ..	36 6	37 0B	37 0	36 0	35 6	36 0

B Buyers. S Sellers. * 50 Shares. † Odd Parcels.

Neumann Group.

The following are particulars of the results achieved by the crushing companies in this group during last month, viz. :—

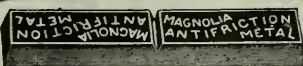
	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ...	37,800	£53,461	£18,325
Wolhuter ...	27,400	36,369	11,455
Consolidated Main Reef ...	21,798	34,126	12,216
Main Reef West ...	19,546	28,187	5,858
Knight Central ...	27,300	31,218	5,231
Totals ...	133,844	183,361	53,085

The monthly profits for the last thirteen months are: 1912—January, £44,280; February, £46,072; March, £52,686; April, £55,333; May, £57,213; June, £60,362; July, £61,770; August, £58,001; September, £59,257; October, £60,085; November, £55,834; December, £54,281; January (1913), £53,085.

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Engineering Notes and News.

Gas Engines.

Mr. J. R. Cowell read a paper before the South African Institution of Engineers, last week, entitled "Notes on a Bituminous Producer Gas Engine Plant." After referring to the development of the internal combustion engine, he proceeded: It is not, however, my intention to discuss this subject in all its branches, but to give some particulars of gas engines using gas produced from ordinary South African bituminous coals. The notorious fiasco with the gas engines installed by the Johannesburg Municipality is not yet forgotten, nor has the influence of such failure ceased to be felt in South Africa. When last I had the honour of reading a paper on internal combustion engines before this Institution, that scheme was only being discussed. Even at that time I gave some particulars of successful gas engine plants which were running in Great Britain using gas produced from bituminous fuel by the Mond process. Had similar plant been installed in Johannesburg, there is every reason to believe that the Johannesburg Municipality would still be using gas engines. An idea existed, and still seems to be held by many people, that ordinary South African coal is not suitable for use in gas producers, and also that the altitude caused difficulties. I would point out, however, that the altitude only affects the dimensions of the engines or producer plant, and that gas engine plants are running successfully at altitudes of 12,000 feet, or more than double the altitude of Johannesburg. And that with respect to South African coals, I knew of no coal produced in South Africa which cannot be successfully used. It is true that some coals are more difficult to work with than others, and that the form of producer plant has to be modified to suit different fuels. The greatest difficulty presents itself with coals that run or fuse together very much, or that produce bad clinker, as in such cases extra labour is required. But when one considers that such fuels as green wood, sawdust, slack coal and wet peat containing as much as 60 per cent. of water are to-day being used in gas producer plants and running gas engines for power purposes in many parts of the world, it would be absurd to think for one moment that South African coals present any special difficulties. All of you will be aware that the ordinary suction-gas plant burning charcoal or anthracite can be, and is, a most economical and successful power producer, and I am very pleased to be able to give you some particulars of a plant which has been working most successfully on ordinary Transvaal bituminous coal. This plant has now been at work for some eighteen months, so that it is in no way in the experimental

stage, and is the first really successful attempt to use such coal. It is situated at the Groenfontein Tin Mines in the Waterberg district of the Northern Transvaal. It was erected chiefly for the purpose of supplying power for treating large quantities of alluvial ground by hydraulic sluicing. The gas-producer plant is of the suction-pressure type, and was constructed by the Power Gas Corporation Company of Stockton-on-Tees, owners of the "Mond" and other patents. The plant was designed with special reference to the conditions under which it was to work, viz., continuous running in a semi-tropical climate, at a high altitude, and with Transvaal coal, and has undoubtedly fulfilled the requirements. Samples of the coal which was proposed to be used were sent to the makers for trial and examination, so as to obtain as far as possible the best results. Proceeding, Mr. Cowell described the plant, its method of working, and the results obtained. Unfortunately, he concluded, Groenfontein is not a very convenient place to visit, being some 180 miles north of Pretoria, and also twenty miles from the railway, but another very similar plant will shortly be erected near Potchefstroom, when I trust you will have an opportunity of making a personal inspection.

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THE ELECTRICAL ENGINEER ON THE RAND.

Mr. J. H. Rider, retiring President of the S.A.I. of E.E., at the annual meeting, said:—

"In vacating the Presidential chair of this Institute, while it is pleasing to be relieved of the responsibility of being your official head after two years' service and to be able to hand over my duties to such an able and distinguished successor as Mr. Kirkland, I feel that I should have done much more while in the position, and that I have neglected many opportunities for promoting the interests of the Institute. My immediate trouble is that I have to write and then read what is called a valedictory or farewell address. The farewell is not to the Institute, but only to the Presidential chair, and for that relief I am thankful. It is, however, a most difficult matter for me to put my thoughts together at this time, and I hope you will not be disappointed if this address is only a short one. There is no lack of subjects about which I might speak. I feel very keenly on a number of matters, some engineering, some professional and others personal, but, owing to a variety of circumstances, the time does not appear to be opportune to deal with them now. I must content myself, therefore, with some very general remarks. There is hardly any limit to the variety of problems which the modern engineer (be he either electrical or mechanical) has to face, and, while every engineer should be a specialist in at least one subject, he must, to be worth his salt, have such all-round experience and knowledge that he can readily adapt himself to any new circumstances which might arise. How is an engineer, who, to earn his daily bread, has to confine himself to a narrow line of work, to obtain such general experience as is necessary for his professional welfare? In Europe and America the matter may not be so difficult, but on the Witwatersrand, where the problems connected with the engineering side of gold mining are paramount, and where there are no large engineering works, unless the engineer is very careful he will find himself in a groove out of which it might be almost impossible to get.

"This Institute and its companion local societies offer to the engineer a ready means of improving his knowledge. By the reading of papers and the interchange of ideas great good can be done, but unless the members are prepared to come forward and express their ideas, the value of the Institutions is greatly reduced. It is not sufficient to pay your subscription and attend the meetings, merely to listen to what others have to say. Every engineer, no matter how humble his position, has some special knowledge or has had some special experience

which his fellows have not, and it is his duty to himself, no less than to his colleagues to disseminate such knowledge and experience. I am aware that many say "Why should I give away what I know to others? If I do they will be as wise as I am, and may perhaps some day be my competitors." This is a very plausible argument, but it will not hold water when properly analysed. Do such people ever consider how much they owe to the work and experience of others, or whether they would hold the positions they do if it were not for what they have been able to learn from others? I am not in any way suggesting that trade secrets should be disclosed, or special processes be publicly advertised. But I do say "live and let live," and am convinced that every engineer gains very much more than he apparently loses by a free exchange of ideas with his fellows. Further, my experience has taught me that he who keeps his ideas strictly to himself seldom rises in his profession. The explanation is simple. If all members of scientific societies freely exchanged experiences, and were neither afraid nor ashamed to get up in a discussion and speak of their difficulties and troubles, the result would be that each individual member would only "give away" his own little bit, and he would receive, in exchange, the "little bits" of all the other members, and surely the whole is greater than its part?

"Some people might imagine that true liberty consists in being able to do exactly as each one likes, but chaos would quickly result, because what the one would like the many would dislike. True liberty would be really achieved when each man respected entirely, not his own, but his neighbour's rights, and, in like manner, by giving one's own ideas for the benefit of others, we should each receive a thousand-fold from the ideas of those others. I am trying to show two things. The first is one way by which each member of this Institute may improve his prospects, and the second is one, and almost the only way by which this Institute can prosper. The two are bound up together, and if these were the last words I should ever be privileged to speak to you I could not be more in earnest than when I ask you, one and all, to contribute more papers and help to get livelier discussions.

"Another means of widening our knowledge and experience is to visit other engineering works. Unfortunately the chances here are very limited, but the opportunities have by no means been exhausted, at any rate so far as this Institute is concerned. I am very sorry that only one visit was arranged during the last year, but, while visiting as a body is good, visiting alone or with only one or two

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other congenial spirits is far better, because much more personal attention can then be given to details. The two means above-mentioned, viz., by taking a deeper and personal interest in the proceedings of this Institute, and of visiting other engineering works will certainly advance our knowledge of local engineering practice, but it will, unfortunately, not help much in keeping us in touch with what is going on in other parts of the world. Unless we are able to pay periodical visits abroad (in my opinion a most necessary and vital thing for those at any rate who are holding responsible positions) we have to fall back upon the various scientific publications. Light literature is all very well as a relief to business worries, but a careful perusal of the leading British and foreign engineering papers is absolutely essential to every engineer who desires to advance in his profession. It may be that our younger members are unable to afford the purchase of more than one or two, but most of the mess reading-rooms of our mines are well supplied; the Seymour Library is free to all, and this Institute itself has a regular supply of all important weekly and monthly publications. A glance at the notice paper calling this meeting will show this. Even if all these channels were closed, it is quite easy for, say, half-a-dozen men to club together to purchase six of the best engineering papers, and to circulate the copies among themselves, each man finally keeping one particular paper for his own.

"All these several means to knowledge will avail a man little, unless he is really earnest in his work. I have often found young engineers grumbling because they were not 'getting on' fast enough, or because, in their opinion, their immediate work was not sufficiently interesting or instructive. 'I am not learning enough,' they say, and in so saying show themselves to be lacking in that which is even better than genius, viz., the ability to do one or two things perfectly, and to make the best of existing conditions. Put yourself in the position of an employer of labour who has to choose a man for a higher and better paid post. Whom would you choose? The assistant who, while perhaps more brilliant than the other, was always complaining that the work he had was not good enough for him, or that he ought to have been advanced long ago, or that his special abilities deserved a higher salary, or the assistant who never failed to carry to a successful conclusion every job, of whatever kind, which was given to him, whether it was to clean the office windows or to work out an abstruse problem, and who did it cheerfully every time without question? Would you not take the latter in every case, for the simple reason that you would know you could trust him whatever he had to do? The ability to do his level best without grumbling in whatever position he finds himself is really a most valuable asset to any engineer. Without it he may have wide knowledge and

experience, but can never become of real value to his employer, and will develop into one of those misfits called a square peg in a round hole. Unfortunately, it is very seldom that a man can obtain a situation which he feels exactly fits him, and he must therefore be prepared to accommodate himself to the surrounding circumstances, rather than to try to change the circumstances to his liking. It is the opportunity that makes the man, and only very seldom that the man is able to make the opportunity.

"Some of the preceding remarks have been written because of many instances which have occurred within my own knowledge on these fields. I have found some electrical engineers on the mines who are dissatisfied because they have to work under the mechanical engineer, and they have not failed to let the management know it, and to create friction where they thought they could do so without getting dismissed. And this from a mistaken idea that by so doing they were advancing their own interests! They could not make a more fatal mistake.

"Another mistake which some engineers make can be best illustrated by an example. Some time ago a person called to see me with the idea of getting my assistance in finding a situation. He had for some years been the Resident Engineer on a certain mining property, and, for what appeared to be very good reasons to the management, had been retrenched. After telling me his qualifications, which were not few according to his statements, he began to speak of his work at his last place. He had nothing good to say of the mining company, the manager or the staff, and from his remarks it appeared that he was the only good man the mine had ever had, and that all the rest were—well, the opposite. He did not appear to realise that, by talking in the way he did, he was doing himself all the harm he could, and giving me a splendid example of the utter want of loyalty which he possessed. I need hardly say that I did not go very far out of my way on his behalf.

"My remarks can be summed up in a few words. Take every opportunity to improve your knowledge and experience; accommodate yourself to the circumstances in which you find yourself placed; and, above all, be absolutely loyal to your employers and those who may be your official superiors. Do not try to get on too quickly, and when the opportunity comes, do not be slow to seize it. Don't slacken off your energies because your reward seems to be a long time coming, and if it should never come in the manner in which your desire, you will have the best of all rewards—the satisfaction of having done your duty. I thank you for having listened to these wandering remarks, and I am sure that, if you live up to the ideas I have tried to indicate, you yourselves, this Institute and the world in general will be the gainers."

Trackless Trams for Bloemfontein.

As a result of pressure of public opinion, the Bloemfontein Council, which recently decided to postpone the spending of £80,000 on a trackless tram system, in view of the departure of the garrison and the unfavourable state of the money market, have now decided to proceed immediately with the construction of the system. The Finance Committee recommended, and the Council has confirmed the recommendation, that the City Engineer be instructed to prepare specifications. The Finance Committee dealt with a verbal report of the City Engineer relating to the question of the particular kind of car best suited to the requirements of the city.

New Thor Diamonds.

The mine manager reports the result of operations for January at the New Thor Diamond Mining Company's property as follows:—Mined and hauled, 4,402 loads; washed, 3,026 loads; floored for future treatment, 1,376 loads. The diamonds recovered from the above washing was 130½ carats, one stone being 13½ carats. The mining operations were considerably hampered owing to a shortage of labour during the early part of the month, but a full complement of natives is now employed. The ground washed during the month included a large percentage of overburden fallen in, and it is hoped that nothing but yellow ground will pass through the pans during the current month, and that a better result would be shown.

COMPANY SECRETARYSHIP.

The SECRETARYSHIP of an INDUSTRIAL or small MINING COMPANY can be undertaken in an established office. H. C. Luke, 43, Commercial Exchange Buildings, Main Street, Johannesburg, Phone 566.

MINING MEN AND MATTERS.

The seventh monthly meeting of the South African Institution of Engineers was held on Saturday night in the Council Chamber of the Chamber of Mines. Mr. F. H. Davis, president, was in the chair. The following elections were approved:—Members: Messrs. E. J. Liddiard, C. K. Turner, and W. McKenzie; associate member, Mr. P. Woodside; student member, Mr. G. E. Walshe. Discussion took place on contributions previously read. A new paper was Mr. J. R. Cowell's "Notes on a Bituminous Producer Gas Engine Plant," which was printed in the current number of the Journal of the Institution. It may be mentioned that the Price Award for the session 1912-13 will consist of a set of technical works of the value of £3 10s. It will be for the best thesis on any one of the following subjects:—Underground Transport, the Handling and Treatment of Accumulated Slimes, the Economic Use of Coal in Power Production, and the Laying, Protection, and Testing of Underground Cables. The papers must be delivered to the secretary not later than March 31 next.

Sheba G.M. Co.

The following are the result of January working at the Sheba Mine:—Mill ran 28 days, crushed 4,850 tons, yielding 3,267 ounces fine gold; estimated profit, £5,357.

Rietspruit Diamond Syndicate, Ltd.

The above Syndicate has recently acquired an option over a portion of the farm Van der Merwesdam, in the district of Fauresmith, and has started active operations. Yellow ground has recently been located, and is now being developed rapidly. The ground is said to be looking well. A washing machine has been despatched, and operations will be started as soon as possible.

Finance, Commerce, and Industries.

The Estimates of Expenditure for the year ending March 31, 1914, were laid on the table of the House of Assembly last Friday week.

Union Estimates.

The introductory memorandum by the Minister of Finance is as follows:—

The total of the estimates of expenditure for 1913-14 is £16,165,519. The total of the estimates for 1912-13 was £17,129,851. The decrease is, therefore, £964,332. The total of the establishments included in the estimates for 1913-14 is 21,384. The total of the establishments included in the estimates for 1912-13 was 20,859. The increase is, therefore, 525. This increase in establishments falls principally under votes "Defence" and "Posts, Telegraphs and Telephones." The net increase under the former vote, after allowing for transfers from other departments, is 197, and, under the latter vote, 416, which more than accounts for the total addition to the numerical strength of the public service. The estimates for 1913-14 consist of 39 votes as against 40 in the preceding year's estimates. Two services, viz.: "Compensation to Colonial Capitals" and "Commerce and Industries" no longer figure as separate votes. The former is now part of vote "Miscellaneous Services," and the latter has been amalgamated with vote "Customs and Excise." A new vote has been created for the expenditure of the Public Service Commission. Vote No. 35, Mines Department: This vote shows an increase in staff of 15, including four learners, and a decrease in expenditure of £83,921. The latter is due to the non-recurrence of the grant of £100,000 towards the Miners' Phthisis Compensation Fund. Provision is made for additional expenditure in connection with the Miners' Phthisis Board and the Miners' Training School.

* * * *

In the House of Assembly, this week, Mr. Sampson (Commissioner Street) asked the Minister of

Manufacture of Explosives. Mines (1) what number of cases of explosives were manufactured during 1912 at the respective dynamite factories in the

Cape, Natal and Transvaal; (2) what were the number of white and coloured persons employed at each of the works. The Minister of Mines stated that the number of cases of explosives manufactured during 1912 at the different factories in the Union were as follows:—Modderfontein, 256,304; Somerset West, 422,158; Kynochs, Limited, 237,252. The number of persons employed at the various factories were: Modderfontein, whites 265, other than whites 660; Somerset West, whites 399, others 592; Kynochs, Limited, whites 230, others 800. Totals for the Union: Number of cases manufactured, 915,714; number of white employees, 894; number of coloured employees, 2,052.

* * * *

Herr R. Renner, Consular Attache, Johannesburg, has written to the Secretary of the Chamber of Commerce as follows:—

German Trade with Africa.

"Having just received the German statistics of the import and export trade of the German Empire for 1911, I have compared the data given concerning the German trade with South Africa with the official statistics published by the Department of Commerce and Industries of the Union of South Africa. Whilst the figures agree fairly well with regard to German exports to South Africa, the same is not the case as regards South African produce exported to Germany. The South African statistics give a total for this item of £1,577,056, whereas the German figures total £3,944,550, thus showing a difference of £2,367,494. The greatest differences are shown in wool (£754,187), ostrich feathers (£334,861), bark (£31,694), and maize (£48,891). Of course such discrepancies are unavoidable, because a lot of South African produce is shipped in the first instance to the British markets, and only subsequently finds its way to the Continent, and because the shipments made with the condition of optional port of discharge are for statistical purposes always declared as being destined for Great Britain. I beg leave to enclose herewith a list of the principal items of South African products bought by Germany in 1911, according to the German

statistics. The compilation may possibly be of interest to the members of your Chamber." (List of values of British South African products bought by Germany during the year 1911. The purchases of the German Colonies are not included in this list.)

Maize	£103,100	0	0
Beans	290	0	0
Flowers, everlasting and dried	11,100	0	0
Fruit, fresh	1,250	0	0
Aloes	4,000	0	0
Plants, etc.	300	0	0
Plants and Herbs, medicinal	350	0	0
Timber	1,850	0	0
Tanning Bark	161,100	0	0
Fish	1,150	0	0
Animals, living	2,250	0	0
Animal Fats	5,000	0	0
Wool, Merino, in the grease	1,710,750	0	0
Do, fleece washed	500	0	0
Do, scoured	181,800	0	0
Wool, cross-bred, in the grease	93,450	0	0
Do, fleece washed	900	0	0
Do, scoured	12,800	0	0
Ostrich Feathers	377,500	0	0
Other Feathers	450	0	0
Ox and Cow Hides	26,900	0	0
Sheep Skins	4,100	0	0
Goat Skins	2,200	0	0
Horns	150	0	0
Wine, in casks	750	0	0
Wine, bottled	100	0	0
Asbestos	19,250	0	0
Precious Stones	26,350	0	0
Other Stones	2,700	0	0
Lead Ore	950	0	0
Bran and Hominy Chop	15,150	0	0
Chrome Ore	500	0	0
Gold Bullion	1,149,550	0	0
Gold Slag, etc.	50	0	0
Glycerine	3,400	0	0
Argol	50	0	0
Manure (Guano)	250	0	0
Bone Meal	50	0	0
Tin Ore	950	0	0
Sundry Products	20,750	0	0
Total	£3,944,550	0	0

* * * *

His Majesty's Trade Commissioner in South Africa has been supplied by the Board of Trade with copies of the final report on the first census of production of the United Kingdom (1907), with tables. These reports

British Trade and South Africa.

may be consulted by those interested in the matter on personal application at the Trade Commissioner's office, Norwich Union Buildings, St. George's Street, Capetown. The following brief summary of the returns embodied in this report has been supplied to us by the Trade Commissioner, for general information. The returns show that the gross value of the output, in the year 1907, amounted to £1,765 millions, that the gross cost of materials used was £1,028 millions, and the amount paid to other firms for work given out to them £25,000,000. Both in the value of output and in the cost of materials used there is considerable duplication, owing to the same goods being recorded in successive stages of manufacture by different firms, while the amount paid to other firms is returned by those firms in their own output. Deducting, therefore, the aggregate cost of materials plus the aggregate amount paid for work given out to other firms, from the aggregate value of output, there is left a sum of about £712,000,000 as "nett output," constituting the fund from which wages, salaries, establishment charges, and profits are defrayed, and representing the value added to materials of all kinds by passing through manufacturing processes. The total average number of persons returned as being employed was 6,984,976 (exclusive of 102,147 outworkers), of whom 6,493,129 were wage-earners and 491,847 were salaried persons (i.e., principals, management staff, and clerical staff). The maximum number of persons employed in the census year was about 7½ millions. It is estimated that, in addition, there were about 1,000,000 to 1,250,000 persons (mostly individual producers, or working in very small businesses) who did not make returns, and that about £50,000,000 should be added to the

ett output" in respect of their productions. The figures above do not include agriculture and fisheries, but, on basis of enquiries conducted by the Board of Agriculture Great Britain and by the Department of Agriculture for and, it is estimated that the aggregate value of agricultural and garden produce sold or consumed by producers and households, was about £210,000,000. The value of fish and shell-fish landed in 1907 was about £718,000. After making all reasonable estimates for the amount of duplication involved, there is shown for the value of the output of the United Kingdom (taken at the point where the agricultural, mining, manufacturing, or other processes are completed, and where distribution for final consumption or export begins) a sum between £1,433,000,000 and £1,448,000,000. Considering separately some of the more important of the groups of trades whose returns are used together in the report, it may be noted that the value of the products of the trades engaged in the manufacture of spirits, drinks, and tobacco is estimated at from £253,000,000 to £255,000,000, after allowing for the purchase of partly-manufactured materials by some firms in the group from others in the same group. The exports of these goods (excluding butter and cheese) were valued at a little over £1,000,000. This group of commodities includes grain-mill products valued at about £65,000,000, bakery products valued at nearly £39,000,000, and brewery products valued £60,500,000 (including duty on such products—beer-duty to the amount of £13,000,000). In the group comprising iron and steel, shipbuilding, and engineering trades, the value of the products (after making similar allowances for duplication between trades within this group) is estimated to be between £244,500,000 and £251,500,000 for the manufactures of iron and steel, to which should be added about £1,000,000 for manufactures of other materials. The exports of iron and steel products in 1907 were valued at £1,668,000, f.o.b. The foregoing total includes products of the general engineering trades (except marine engineering), which were valued at between £82,500,000 and £150,000; the products of the shipbuilding and marine engineering trades (excepting wooden ships and boats) which were valued at between £15,500,000 and £16,500,000; the products of the electrical-engineering trades valued at £140,000; and those of the cycle and motor trades at between £10,900,000 and £12,900,000. In the textile trades (including the manufactures of clothing), the value of textile goods produced is estimated as being between £1,000,000 and £234,000,000, of which were exported in 1907 goods valued at nearly £164,000,000 f.o.b. The value of the cotton goods alone is estimated at between £1,000,000 and £133,000,000; that of woollen and worsted goods at between £65,000,000 and £66,000,000; and that of flax, hemp, and linen goods (exclusive of cordage and ropes) at about £23,000,000. In mining and quarrying, the products (after allowing for coal used in connection with railways and quarries) are valued at about £134,000,000, of which were exported products valued at £13,900,000. The total output of coal mines in the year exceeded £119,500,000. In the building and contracting and allied trades, the value of the output of the products of the group is estimated at about £113,000,000, of which about £74,500,000 represents the value of building work, and £54,500,000 the value of work done on railways, tramways, roads, docks, and other construction work. The mechanical power used in manufacturing industries of the United Kingdom was produced by engines whose capacity is returned at over 755,000 horse power. Of this total, practically 2,500,000 h.p. was required by mines and quarries, but the iron and steel, engineering, and shipbuilding group of trades required a little less (viz., 2,347,000 h.p.). If the large purchases of electricity, amounting to about 125,000,000 Board of Trade "units," for power and lighting purposes, by manufacturing firms in this group be taken into account, its requirements in regard to mechanical power will account for about one-fourth of that used in all industries. The textile trades were also extensive consumers of power; nearly 100,000 h.p. represents their engine capacity, in addition to which nearly 21,000,000 units of electricity were purchased, and power was rented to the extent of about 100,000 h.p.

Consul Gausaulus, of Johannesburg, writes in his last published report as follows:—"The three leading countries supplying the imports into the Union of South Africa are the United Kingdom, Germany, and the United States, in the order named. The United States was the only country of the three showing an increase in the proportion of the total imports during 1911 as compared with 1910. Among the lines showing appreciable increases in the imports during last year were agricultural machinery and implements, foodstuffs, including coffee, rice, sugar, condensed milk, tinned and other preserved meats, jams and jellies, preserved fish, bacon and hams; hardware, furniture, clothing, woollen goods, tobacco, tin, glycerine, clocks and watches, glass and glassware, plate and plated ware, fire engines, printing machinery, wire fencing and standards, oils and oilmen's stores, paints and varnishes, bags, silks, arms and ammunition, drugs and chemicals, jewellery, paper products, phonographs, saddlery and harness, toys and sporting goods, stationery, and vehicles, including motor cars, motor cycles, and bicycles. There is a large trade in imported vehicles, Johannesburg and surrounding district being an especially good market for all classes of vehicles, particularly motor-cars, motor cycles, and bicycles. While England holds practically all of the market for motor cycles and bicycles, and still supplies the great bulk of the motor-cars used in South Africa, the imports of automobiles from the United States have steadily risen during the last few years, and would, in the opinion of many, be much greater but for the fact that the prices charged the local agents by certain American firms having the exclusive handling of the machines in this country have been considerably in excess of the manufacturers' prices. In addition to this fact, many of the local dealers complain of the difficulty experienced in being supplied with cars of American manufacture. There have been many vexatious delays in fulfilling orders, and numerous sales have been lost as a consequence. These

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are matters which should receive the earnest attention of American manufacturers, as they have an important bearing on the success of the foreign trade. The general conditions of South Africa are such that there is a demand for essentially every kind of goods made in the United States, and all that is needed to bring about an increased trade with the country is to give the market that careful attention which it merits."

Consul Wakefield, of Port Elizabeth, writes:—"The outstanding feature of trade for the calendar year 1911 in the Port Elizabeth Consular district was the continued confidence in commercial circles as evidenced by the gradual but healthy increase in both imports and exports over the preceding year. During the three lean years of 1907, 1908, and 1909 the large importing houses in Port Elizabeth and East London were obliged to face great commercial depression, and in many instances assume heavy financial burdens. It is greatly to the credit of these business houses that they were able, almost without exception, to weather the storm until business conditions improved towards the close of 1909. Since the beginning of 1910 trade conditions have steadily improved, until the average business man has become optimistic with regard to South African trade prospects. In this Consular district, which is agricultural, conditions in 1911 were never more favourable. Indications point to a satisfactory trade for 1912. The following articles, in which American exporters are interested, showed increased importations during 1911 over the preceding year: Apparel and slops, arms and ammunition, brushware, clocks, watches and jewellery, cotton goods, drugs and medicines, electrical fittings, articles of food and drink, furniture, glass and glassware, haberdashery and millinery, hardware and cutlery, agricultural implements and tools, musical instruments, iron and steel manufactures, leather manufactures, including boots and shoes, paints and colours, manufactures of paper, surgical and dental supplies and appliances, and motor-cars and parts. Personal representation, prompt shipments, and more liberal terms of payment are among the principal requisites to increased trade with the country. Where purchases are sufficiently important to warrant it an experienced representative should cover the ground thoroughly and carefully. Local agencies or exclusive sale rights should be granted only to persons or firms in touch with the trade which is sought. Many promising products have met with indifferent success because they have not been properly represented. To introduce thoroughly even standard articles, it is essential to present them personally and in detail. Catalogues with price lists and discounts are valuable adjuncts, and there is scarcely a day without a demand for catalogues at this office. Farmers are fast installing modern machinery and applying scientific methods. American agricultural implements and machinery are features at the annual exhibitions held in the large towns throughout the district. The practical value of exhibits at these annual shows, properly shown, advertised, and personally supervised by men of experience, can scarcely be exaggerated. The farmers of the district are comparatively ready purchasers when convinced of the merit of farming accessories and appliances."

Zaaiplaats Tin.

The results for the month of January, 1913 are as follows:—Days run, 27.2; ore milled, 4,432 short tons; residues re-treated, 800 short tons; concentrates won, 90 long tons; average value of concentrates, 70.5 per cent. M.T.; estimated profit for the month, excluding Government tax on profits, £7,062 10s. 4d.; add adjustment in respect of estimated values of previous shipments, £9 17s. 11d.; profit declared for the month, £7,072 8s. 3d.; capital expenditure, nil. The profit for the month has been adversely affected due to working costs having borne extra expenditure in starting up the new slimes plant, building of slimes dam, and exploration work. The fall in the price of three months tin has also adversely affected the profit. Development for the month was entirely satisfactory, the outstanding feature being the disclosure of a large body of high grade ore in No. 13 section which is at present being opened up on a fissure formation.

Tenders Accepted.

The South African Railways and Harbours have accepted the following tenders:—Soft soap: Tender received through the High Commissioner, London, £16 per ton of 2,240 lb., £16 15s. per ton of 2,240 lb.; £17 per ton of 2,240 lb.; £17 9s. per ton of 2,240 lb.; the Union Chemical Co., Ltd., Johannesburg, £20 16s. 8d. per ton of 2,240 lb. Hard yellow soap: Lever Bros. (S.A.), Ltd., Durban, 24s. 9d. per 100 lb.; New Transvaal Chemical Co., Ltd., Delmore, 29s. 9d. per 100 lb.; Union Soap Works Co., Ltd., Pretoria, 30s. per 100 lb. Tallow: Imperial Cold Storage and Supply Co., Ltd., Capetown, including cost of casks 31s. 3d. per 100 lb., not including cost of casks 30s. per 100 lb.; Hannam and Co., Johannesburg, including cost of casks 35s. per 100 lb., not including cost of casks 34s. 4d. per 100 lb.; Hannam and Co., Johannesburg, including cost of casks 35s. 6d. per 100 lb., not including cost of casks 34s. 10d. per 100 lb. Candles: Patlansky Bros. and Schauder, Port Elizabeth; 3s. 9d. per dozen packets; K. Gundelfinger, Durban, 3s. 8d. per dozen packets; P. Gillespie and Co., Johannesburg, various. Galvanised steel sheets: Wolverhampton Corrugated Iron Co., Ltd., Cheshire, various; J. Summers and Sons, Chester, various; S. Sykes and Co., Johannesburg, Telegraph Manufacturing Co., Johannesburg, various.

The South African Railways have accepted the following tenders:

NOVEMBER, 1912.

(1) Teak Logs and Planks.—Special order: (a) 20,000 cubic feet of "Crown" quality logs at £22 12s. 6d. per load of 50 cubic feet, £9,050. Tender 410: (b) 97,800 cubic feet of English first-class squares, Europe quality, logs and planks at £26 9s. 2d. per load of 50 cubic feet, £51,752 10s. (2) Vollerstedt Casing Plant (Structural Steelwork).—The Thames Ironworks and Shipbuilding Co., at £2,030 11s. (3) Paraffin Oil for Burning and Cleaning.—(a) Paraffin oil, "Laurel" brand, for burning, at 4s. 11d. per imperial gallon, £17,039 16s. 6d.; (b) paraffin oil for cleaning at 4s. 3d. per imperial gallon, £581 19s. (4) Braamfontein—Fumigator House and Bedding Store.—Messrs. Williams Bros., Johannesburg (approximately), £967. (5) Alkmaar-Elandschoek Line—Deviation No. 24.—Messrs. J. and H. Lange (approximately), £3,955 13s. (6) Blank Cards for Passenger Tickets and Seasons.—Messrs. Waterlow and Sons' tender.

DECEMBER, 1912.

(1) Timber.—Messrs. Millars' West Australian Hardwood Co., Ltd., Capetown, sawn pitch pine logs to value of £1,893 (approximately); Messrs. W. F. Johnstone and Co., Johannesburg, Oregon pine, deals and logs to value of £2,203 (approximately); Messrs. Hunt, Leuchars and Hepburn, Ltd., Johannesburg, Oregon pine deals for Durban to value of £354 (approximately); Messrs. W. and G. Scott, Ltd., Capetown, Oregon pine deals, pine boards "strictly clear," carpenters' clear pine, planed shelving (Canadian Yellow), to value of £6,320 (approximately). (2) Coal for Municipalities.—Capetown: The Natal Navigation Colliery, Glencoe Colliery, Dundee Coal Company and St. George's Coal Company, 12,000 tons at 6s. 6d. per ton. Port Elizabeth: Vryheid Railway Coal and Iron Co., Ltd., 2,968 tons of pea coal at 4s. 6d. per ton; 504 tons of round coal at 7s. per ton. East London: Hattingspruit Collieries, Ltd., 3,600 tons of pea coal at 15s. 6d. per ton. (3) Antiriftion Grease and Carbide of Calcium.—Messrs. J. and R. Niven, Johannesburg: (a) Antiriftion grease: 93 tons at £18 per ton, 6 tons at £18 17s. 6d. per ton, 7½ tons at £18 5s. per ton, 18 tons at £16 10s. per ton. Messrs. Cotts and Co., Johannesburg: (b) Carbide of calcium: 120 cwt. at 16s. per cwt.

For the supply of provisions and stores to the Government Guano Islands during the period 1st January, 1913, to 31st March, 1914, and the following tenders have been accepted:—J. C. Steytler and Co., Ltd.; Millner and Co.; Wm. Spilhans and Co.; The Gourock Ropework Export Co., Ltd.; The Texas Company; W. and G. Scott, Ltd.; Bach and Hickson, Ltd.

T. Brown, Pretoria, at £510, for alterations to church at Leper Asylum, Pretoria; J. Dunn and Co., Krugersdorp, at £4,387, for erection of public offices at Murraysburg, Cape Province; W. J. Corrigan, Pretoria, at £701 10s., for erection of female patients' quarters at Leper Asylum, Pretoria; C. F. Coombs, Pretoria, at £499 15s., for erection of European visitors' rooms at Leper Asylum, Pretoria.

Messrs. Whitehead, Morris and Co., Capetown, for the printing of trade returns compiled by the Customs Statistical Office, Capetown; Messrs. the South African Electric Printing Company, Capetown, at £220, has been accepted for the supply of 635,000 forms S.B. 9 and 10.

G. F. Warren, Potchefstroom, at £793, for erection of teachers' quarters at Zoutpan, No. 68, Lichtenburg; Franken Bros., Ermelo, at £754, for erection of teachers' quarters at Haartebeestkui, No. 135, Standerton; H. H. Beamish, at Bloemfontein, for £2,677, alterations and additions to Eunice High School for Girls, Bloemfontein; D. Watson, Bloemfontein, at £639, for erection of school at Waterworks, Bloemfontein; Ford Brothers, Heilbron, at £855 10s., for additions to school at Heilbron; H. Bryan, Brandfort, at £748, for additions to school at Brandfort; C. F. du Plessis, Smithfield, at £540, for additions to school at Goedemoed; D. Watson, Bloemfontein, at £500, for additions to school at Ventersburg; Peddie and Drummond, Bethlehem, at £589 15s., for additions to school at Lindley.

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Automobile Notes.

A Year's Progress.

Looking back on the year 1912 one finds that there are two dominant features with regard to the progress of the pastime of motoring. The first is that the medium-powered cars of British design and manufacture proved to the Continental manufacturers that they were the best produced. For years makers abroad cared little for the competition of the British motor industry. Last year it was clearly demonstrated that Great Britain not only had learned to build good motor vehicles, but could beat the foreigner at his own particular sport—road racing. This was accomplished when the Sunbeam cars won the Coup l'Auto in the Grand Prix race at Dieppe on June 26th. The victory was beneficial alike to the makers of the winning cars and to the British motor industry generally. Its consequences were far-reaching, and notwithstanding the slight set-back the motor trade suffered in the early part of 1912, due to strikes in the transport world, the orders came in so freely during the second half of the year that the output of the whole trade showed a large increase and consequent prosperity.

War Motor Lorries.

With the object of encouraging makers of motor lorries to place on the market types of vehicles suitable for military purposes the War Office are offering a subsidy of £110 to be paid in instalments spread over three years to all owners of such lorries who will sell them to the Government instantaneously in time of need, keep them in running condition, and allow them to be inspected at any time by Government officials.

The Cycle-Car.

The loud and ever-increasing demand for cheap—that is, economical—motoring has fostered the cycle-car. That and the rapid appreciation of motoring by a class that would never have ventured to own a pony and trap form part of the motoring progress of the year just passed—a most important part too, both from the view of motoring as a pastime or sport, and from that of the trader or dealer in the self-

propelled vehicle. It is this growth of popularity of the pastime that sold some 5,000 low-priced cars of American origin to buyers in England last year—this out of a total output of 50,000 cars in the United Kingdom and Ireland. Of that total England produced about 25,000 cars, the Continent sent 20,000 cars, while America, as stated before, supplied the balance. Unfortunately for this public that is asking for a fully equipped motor-vehicle for as near to £100 as possible, they will have to patronise either the low-powered cycle-car or the high-powered American runabout as long as the British manufacturer finds he can sell his higher-priced and better made goods. It was hoped last year that the low-priced British made motor-car would arrive. But the year has ended, and the English manufacturers' reply to the demand is the cycle-car. Still, this is an advance, for the good cycle-car is better for the motorist of very moderate means than the bad motor-car that will last but a short time without a repair bill.

The February number of *Motoring in South Africa* states that the Union Government has definitely decided not to introduce any legislation in Parliament with reference to motor regulations, but that the matter will be left to the Provincial Councils. For the Cape Province a draft Bill is in preparation for the coming session of the Provincial Council, to assemble in March next. The paper expresses the hope that, as far as possible, uniformity as between the different provinces may be ensured. The question is further touched upon in the course of an interview with Mr. J. W. Jagger, who opines that so long as Sir Frederic de Wail's Bill is on reasonable lines no fair-minded motorist will object. "I recognise," he says, "that it is not unreasonable to register and number our motor cars, and a registration fee will be necessary to cover expenses; but when one comes to the question of special taxation, it must be borne in mind that the motor car is already heavily taxed through the Customs, and the motorist in this country is therefore on quite a different footing to that on which he was in England before the passing of the Motor Act of 1903." Our technical contemporary offers a word of warning to the Railway Department with reference to the inauguration of the system of motor transport, as exemplified in the Bot River-Hermanus service. The holiday traffic resulted in serious

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damage to both road and vehicles, and the paper offers some practical suggestions regarding the organisation and supervision of such services which, if acted upon, may assist in enabling future developments in the same direction to be attended with greater initial success.

In connection with the search for an alternative fuel to petrol for the internal combustion engine, some experiments were made by an engineer a few years ago with a sample of shale. He states that, by distillation, he proved to his satisfaction that the shale was exceedingly rich, yielding a good percentage of volatile oils as well as heavier oil and gas. In addition, the residue in the retort appeared to be nearly pure fire clay. He is convinced that from this shale a valuable motor fuel can be obtained, not only in abundance, but at a very low cost. He says there are probably from three to five million tons of the stuff available at no cost for mining, as it is already on the surface—the accumulation of over seventy years—and that the right to work it could probably be obtained at a nominal charge per ton.

The exorbitant price to which petrol has been advanced by the ring which controls the supplies is now likely to affect the general public in the larger centres of population—in the British Isles as well as the ordinary motorist. In mail week the "Taxi" strike was in progress, and is likely to cause a good deal of annoyance and inconvenience to the man in the street, who has become habituated to the use of a taxi for business or other purposes. It may well be that if the voice of the general public is raised in protest against the interference with its comfort and convenience, which the exorbitant price of petrol has brought about, the Government may be moved to take some steps which will tend

to an amelioration of the position. It is not likely, as has been suggested, that the Government would do anything in the direction of fixing the price of petrol, but a great impulse would be given to the movement now in progress for discovering an alternative fuel, if some handsome encouragement to the people who are experimenting with this object were offered. After all, the question of motor fuel



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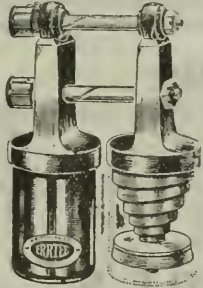
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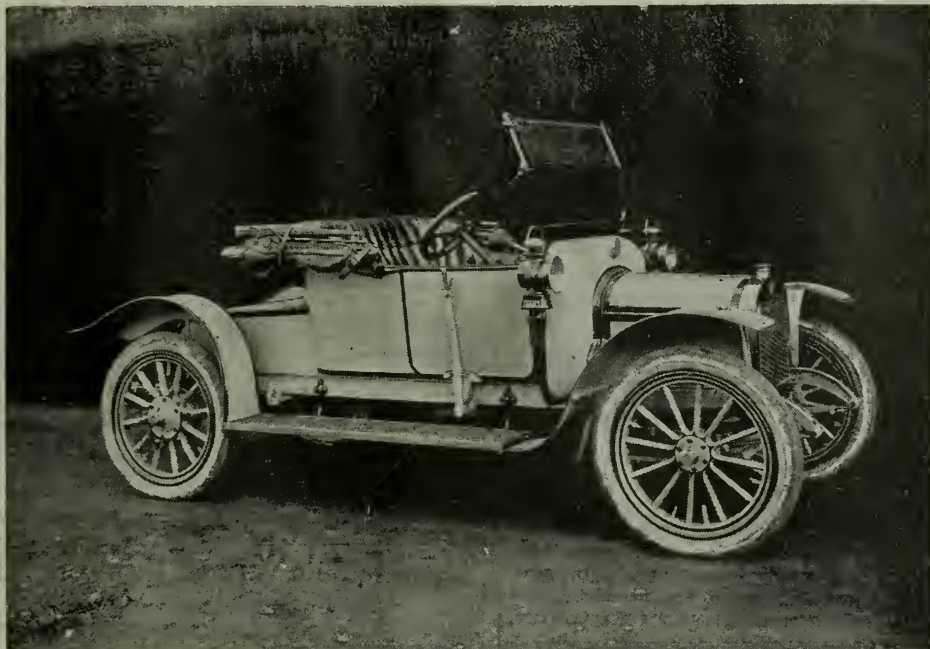


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may be said to have become a national one since the Admiralty have commenced to propel war vessels with it, and the land forces are rapidly adding to their fleets of petrol lorries and tractors. Private enterprise is doing a great deal to solve the problem, but some substantial assistance from those who control not only the motorist, but all classes of the community, seems to be called for at the present juncture.

An Australian motorist, on a journey from Sydney to Brisbane, interested himself on the way by taking with his speedometer the speeds of different fugitives before his car. He found that fowls ran at fifteen miles an hour. Mongrel dogs and kangaroos averaged 25 miles an hour—one hare put up a record of 40 miles an hour, but succumbed beneath the car wheels in the end.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

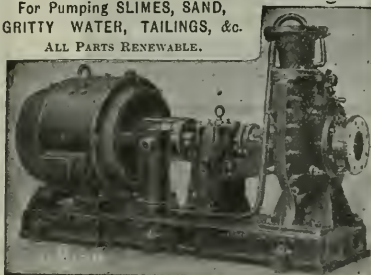
INVESTORS' DIARY.

The following company meetings have been announced:—

- March 12.—Worcester Exploration Co., at Worcester, C.P.
- „ 18.—Cassel Coal Co.
- „ 28.—Jupiter, Simmer Deep, Wolluter, Bucks Reef.
- July 15.—Transvaal Consolidated Lands.

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Robinson Group.

The following are the results of operations at the Robinson Group of Mines:—Langhaagte Estate: Tons milled, 5,105; total yield, 14,592 fine ounces; estimated profit, £16,004 (5s. 9.71d. per ton milled). Randfontein Central: Tons milled, 125,923; total yield, 64,444 fine ounces; estimated profit, £86,152 (7s. 7.53d. per ton milled). Totals: Tons milled, 281,028; total yield, 79,036 fine ounces; estimated profit, £102,156.

Kleinfontein Group.

The following are the particulars of the results of operations on the New Kleinfontein Company's property for January: Stamps, 210; days run, 30.085; tube mills, 4; tons milled, 51,100; gold recovered, 16,697.514 fine ozs.; net value, £70,134 7s. 3d.; profit, £23,495 17s. 7d.; working costs (excluding development), 16s. 10.768d. per ton; development to working costs 1s. 4.707d. per ton; total working costs, 18s. 3.475d. per ton; capital expenditure, £2,997 15s. 8d.

Brakpan Mines.

Stamps working, 150; running time, 29 days; ore crushed, 59,130 tons; tube mills working, 8; ore hoisted, 69,284 tons; ore from dump, 1,485 tons; waste sorted, 16.23 per cent.; fine gold declared, 21,452 ozs.; value declared, £90,310, equal to 30s. 7d. per ton milled; working costs, £51,195, equal to 17s. 4d. per ton milled; working profit, £39,115, equal to 13s. 3d. per ton milled.

Consolidated Main Reef.

The working profit for the quarter was £40,887 (13s. 4.680d. per ton). Ore milled 61,071 tons, working revenue £105,236 (34s. 5.565d. per ton), working expenditure £64,349 (21s. 0.855d. per ton), capital expenditure £17,266. The development amounted to 3,873 feet, excluding main cross-cuts, ore passes and prospecting work, 2,321½ feet or 73.6 per cent. has been on reef. Of this 712 feet or 30.7 per cent. has been payable of an average value of 8.3 dwts. over 48 inches. And 1,609½ feet or 69.3 per cent. has been unpayable of an average value of 3 dwts. over 48 inches. Of the payable portion 683½ feet or 96 per cent. has been on Main Reef leader, of an average value of 8.3 dwts. over 48 inches. And 28½ feet or 4 per cent. has been on South Reef, of an average value of 7.9 dwts., over 48 inches. Ore reserves, September 30, 1912, 621,570 tons; ore developed for quarter, 38,790 tons; total, 660,360 tons. Less ore mined for quarter, 71,461 tons; less difference in stopping widths and Main Reef mined but not shown in reserves and from stopes previously called unpayable, 19,211 tons; ore reserves, December 31, 1912, 608,110 tons.

Witwatersrand Deep.

The operations at this mine during the quarter resulted in a working profit of £55,135 (9s. 7.97d. per ton). Ore milled 114,100 tons, working revenue £157,142 (27s. 6.53d. per ton), working expenditure £102,006 (17s. 10.56d. per ton), capital expenditure £3,684. The development for the quarter amounted to 3,894 feet. Of the total development 2,826 feet or 72.57 per cent. has been on reef. Altogether 2,199.5 feet have been sampled. This total comprises 2,044.5 feet, or 92.95 per cent., averaging 14.61 dwts. over 33.07 inches and 155 feet, or 7.05 per cent., averaging 5.43 dwts. over 23.64 inches. The payable ore developed during the quarter amounted to 123,984 tons at 10.79 dwts. over 48 inches. The ore reserves are now being re-calculated as at the end of the year. The amount of water pumped for the quarter was 163,384,505 gallons and cost £4,588 15s. 3d. to pump, equal to 9.65d. per ton milled.

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NOTICE is hereby given that an Interim Dividend (No. 49) at the rate of 5 per cent. (one shilling per share) has been declared by the Board of Directors, payable on 22nd February, 1913, to all Shareholders registered in the Books of the Company on 18th FEBRUARY, 1913.

The Transfer Books of the Company will be closed from 19th to 22nd February, 1913, both days inclusive.

Dividend Warrants will be posted to Shareholders on the 22nd February, 1913.

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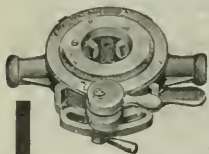
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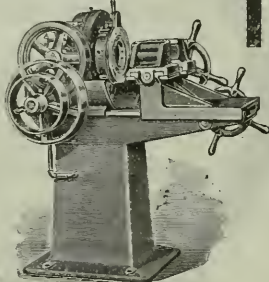
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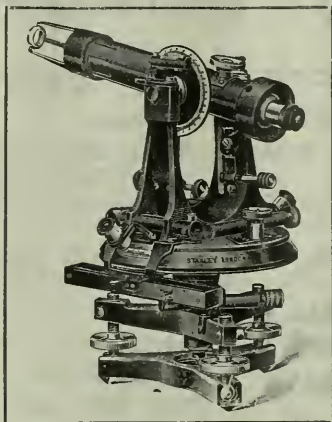
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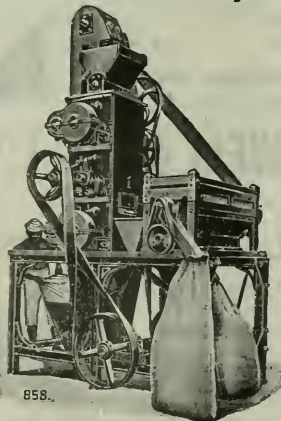
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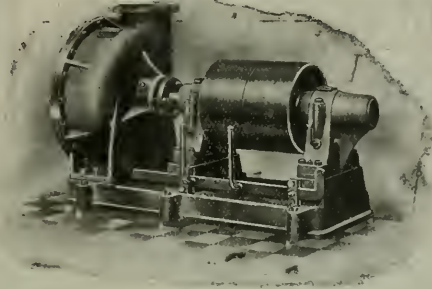
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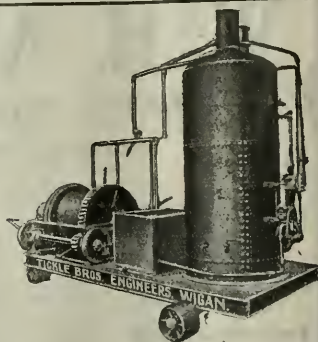
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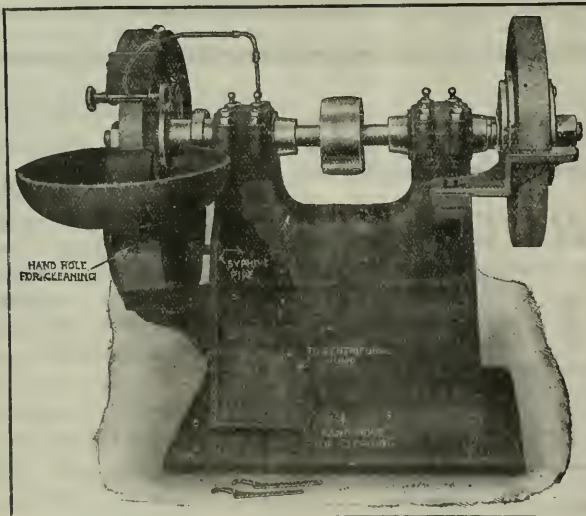
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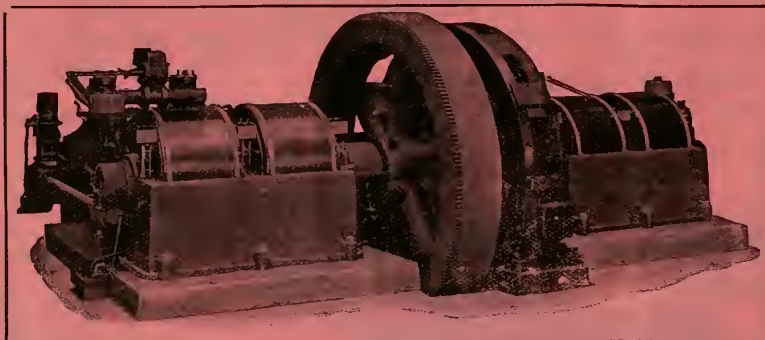
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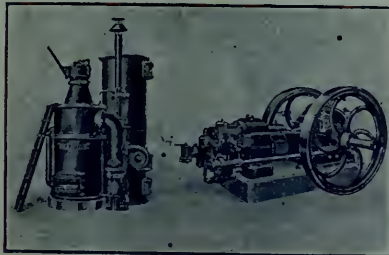
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